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GLEANINGS A JOURNAL DEVOTED TO BEES AND HONEY AND HOME INTERESTS **BEE CULTURE** ILLUSTRATED SEMI-MONTHLY Published by THEA F. ROOT CO. \$1.00 PER YEAR MEDINA, OHIO.

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"IS IT TRUE that bees are less likely to sting one with white clothing than with black?" is a question in *American Bee Journal*. In answer, 19 say yes, and 7 think not or have not observed.

IN REPLY to F. L. Thompson, p. 14, I've used illusion for the face of bee-veils, and it's the best thing I ever used if it would last. But it's so unsubstantial that it's practically too expensive.

SEPARATORS of wire cloth are spoken of on p. 15. They were used by N. Betsinger a good many years ago, were greatly praised by him, and I think they were patented, but somehow no one else seemed to use them.

THE EDITOR gets the start of me on p. 6 by means of a "perhaps" which leaves the matter in suspense, and then his head is so turned that he says, "But wide frames are section-holders without top-bars." O Ernest! [So they are, doctor. If not, what are they?—ED.]

A PURE-FOOD CONFERENCE for Illinois is called by the presidents of ten different associations, agriculture, horticulture, apiculture, etc., led by the president of the State Board of Health. May be Illinois will climb up to where Ohio stands, so you Ohio fellows won't look down any more on us Suckers.

C. T. BONNEY, p. 14, seems to think large queens a great desideratum: but don't Doolittle and others say that medium-sized queens are best? [There, now, I always supposed Doolittle was an advocate of large queens, as his method certainly produces them. I have always found that the large ones were the most prolific.—ED.]

FOR CANNING FRUIT, honey is better than sugar, according to E. D. Howell, in *American Bee Journal*. Cook fruit till tender in a tight-covered kettle in the oven, then add the honey, bring to a boil on top of the stove, and seal up; $\frac{1}{4}$ pound honey for each pound of peaches or other fruit not very sour. No water need be added except for such dry fruits as quinces and apples. Use best honey.

A SERIOUS OBJECTION to C. P. Dadant's plan of adapting the number of combs to the size of the colony is not mentioned by him, p. 8. If the hive is not filled with brood-combs, the part of the super that comes over the vacancy will be poorly worked by the bees. For extracted honey, of course that makes little difference.

"WE ARE TOLD in the bee-journals that the poison of the bee is formic acid," says Geo. L. Vinal, page 15. No, not nowadays. The poison is something separate from the formic acid. See Straw, p. 42, Jan. 15, 1898. To the question why that strong horse died from the stings, I'll venture the answer that he got more poison into him than he could dispose of.

BEE CHAT, the British quarterly published by S. Simmins, gives promise of continued life, and has now become a monthly. The tone of *Bee Chat* is such that one can not help wishing it long life. Somehow good-natured people seem to live longer than crabbed ones, and that's pre-eminently true of bee-journals. [Yes, it is a very sprightly journal. It has one quality that makes it readable; namely, its editor is full of enthusiasm.—ED.]

F. GREINER doesn't paint with any too high colors, p. 10, the advantages of the great German bee conventions, and certainly doesn't give a just idea of the large attendance, and especially of the immense membership of the association. Some things, as the drinking and smoking, and the time occupied with other than bee matters, would not be relished by Americans; but on the whole the Germans are far ahead of us in the matter of organization.

DOOLITTLE is a hard man to do any thing with. Between him and Dadant I have a hard time of it. In that Straw, p. 869, I chuckled to myself that I had Doolittle in a corner; but he slides out of it as easily as you please by saying, p. 11, that extracting makes bees feed the queen so she doubles her laying. That dazes me, for I've no means to dispute it. I've only breath enough left for a question or two. Bro. Doolittle, when I find a queen occupying 12 to 14 combs with brood without any extracting, would that same queen occupy 24 to 28 Langstroth frames if I should extract? And if I find a queen keeping 8, 9, or more

Langstroth combs full of brood, when working for comb honey, would such a queen be entertained to her fullest capacity as to egg-laying if confined to $6\frac{3}{4}$ frames?

I'M AFRAID that, if the punctuation in GLEANINGS were to be left to the tastes of the writers, as F. L. Thompson suggests, a good many things would not be very clear. Who is to decide which writers have the proper taste? I have some grudges against the proof-reader, and should like to be independent of him; but I don't know enough yet to be sure whether a comma or a semicolon is the right thing, so please W. P., keep sprinkling in a few commas and things wherever they'll do the most good, so as to make my writings intelligible—when you can.

THE IDEA that sections of honey will pass better for genuine when daubed with propolis, Editor Holtermann thinks about as reasonable as to have cows' hair in butter to attest its genuineness. [I quite agree with Mr. Holtermann; and yet that idea does obtain with quite a large number, but wholly, I believe, on false grounds. A clean section box of honey will outsell a propolis-daubed one in most markets; and yet if I can judge by the honey that comes here (and we buy thousands of pounds every year) many bee-keepers, at least, seem to think that scraping is not a necessity. Whether they think so or whether they are too lazy to go to the extra trouble, is a question.—ED.]

ON PAGE 6 I made such bad use of language that it might be understood that Doolittle lets the young queen cut out queen-cells in his plan for preventing swarming. Not so; the bee-keeper cuts them out at the time of putting in the young queen. [Yes, your language was susceptible of a double meaning. I might have known that no queen, young or old, would cut down cells *invariably*, when introduced to a queenless colony. I have introduced dozens of queens that let cells go, with the result that a virgin would hatch, and then the old queen would be missing. We have made it a rule that it is never safe to attempt to introduce valuable queens without first destroying cells in the hive. I can not imagine why I should have fallen in with the idea so readily unless it was because I thought Doolittle generally right on points of this kind.—ED.]

F. L. THOMPSON is right, p. 14, in objecting to the use of quotation-marks that don't quote. I'm going to try to do better in that direction—see if I don't. But I feel like asking Bro. Thompson whether that veil-stuff he talks about a few lines above is not illusion instead of "illusion." [I quite agree with Mr. Thompson in believing that there has been too free a use of "quotation-marks that don't quote" (*these* quote). Sometimes they are used as a sort of apology for a word not fully recognized by the dictionary; sometimes for the evident purpose of introducing pleasantries. Their occasional use, however, in our columns has been the choice of the writers and not of the proof-reader, who has marked out thousands. But as Mr. Thompson claims that

a writer should be indulged in the exercise of his own "notions" in punctuation he can not very well complain if some should ride the quotation hobby too freely.—ED.]

F. L. THOMPSON asks why I say "*Review*" instead of "*The Review*," p. 14. For the same reason, I suppose, friend Thompson, that in *Review*, page 332, you say "*American Bee Journal*" instead of "*The American Bee Journal*," it's shorter. I suppose that "*The Bee-keepers' Review*" is its full title; but if there is no misunderstanding it's not a bad thing to shorten it. If you drop out "*Bee-keepers*," why object to dropping the less distinctive part of the name? [This is a case of hypercriticism. There are really many things that sorely need correction, without taking up those that are of no consequence. It matters little whether we say *Review* or *The Review*.—ED.]

DEAD BROOD "greatly resembles foul brood; and the only distinct differences are, first, it is not contagious; and, second, very little of the brood dies," says a footnote, p. 20. Isn't there a distinct difference in ropiness, and perhaps smell? [Yes, I have seen quite a little dead brood that was ropy. Once we had considerable of it in our apiary. It did not seem to spread from one colony to another, nor was there any particular odor to it that I remember. Indeed, there is no perceptible smell to foul brood when there are only a few scattering diseased cells. I formerly thought that the crucial test of foul brood was ropiness; but after having seen these dead or pickled brood cases I have had to conclude that it is not necessarily a decisive symptom. I think we may say this, however: That dead or pickled brood is so rare that, when larvae assume a brown color, and are somewhat shrunken, lie on the sides of the cells, and are ropy, it indicates foul brood. In speaking about the odor of this disease it does not seem to be very pronounced—to me at least—unless the brood-combs are rotten with it, and then there will be that pronounced cabinet-maker's glue-pot smell.—ED.]



TRAVEL-STAIN; WHAT IS IT?

Conditions Under which Travel-stain, so called, May be Avoided; a Valuable Article.

BY J. E. CRANE.

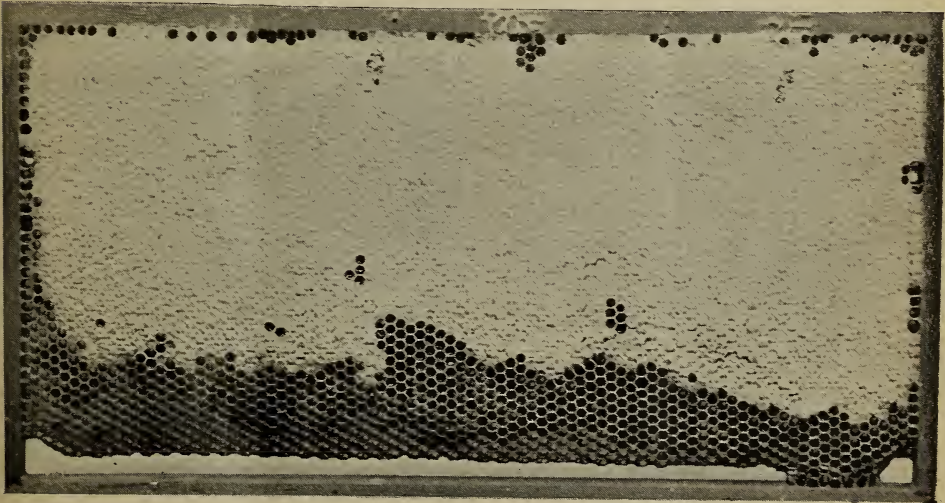
Whiteness appears to be largely the standard of excellence in comb honey in the United States. Given finished combs that are fairly well built in the sections, and the honey will grade according to its whiteness. Indeed, so true is this that it has become one of the most important questions the apiarist can ask: How may the *whitest* combs be secured? Some

one has told us that the way is to remove each comb as soon as sealed or finished. Where but a moderate number of colonies are kept, and the bee-keeper can give a good deal of time to the work, it may be helpful to do so; but where several hundred colonies are kept in several yards (it may be many miles apart) it is impracticable to remove honey, as a rule, only by finished supers; besides, we often find large numbers of sections or combs discolored as soon as finished, while on other colonies the supers may remain for weeks or even months without the combs becoming soiled or discolored.

Plain sections that were introduced a year ago, it was claimed, would, with a fence or open separator, produce whiter combs than the old style sections with solid separators. To this claim, doubtless, was due much of the enthusiasm with which their introduction was received. Valuable as these may prove, they

be "*unsoiled by travel-stain*, or otherwise." Travel-stain alone being mentioned or called by name, this, presumably, was considered the most common cause of discolored combs. Every bee-keeper is supposed to know just what travel-stain is; but I have sometimes wondered if I do. I suppose it refers to that slight tinge of color we find on or in the cappings of surplus combs, slight near the top of the section, and usually increasing toward the bottom, where it becomes a light cinnamon, or yellow or brown, or it may be more pronounced in the middle of the comb, with less at top and bottom.

From the wording, the supposition is that somehow the bees, in flying through the air or alighting on a flower, or in passing through the hive, get their feet dirty, and, in traveling over the new white combs, soil them. To prove this theory it may be noticed that the lower part of the comb, where travel is great-



COMB THAT HAS BEEN ON THE HIVE FOR MONTHS WITHOUT TRAVEL-STAIN.

are not likely to eradicate wholly the evil of soiled or discolored cappings.

Before discussing the best means of securing the whitest combs, it may be well for us to study the causes of the discoloration of surplus combs. I might first mention *pollen-stains*. Sometimes bees seem either to have all the pollen they need in the hive, or have some antipathy to certain kinds of pollen, and refuse to gather into pellets all that adheres to them while seeking honey, and return to the hive pretty well covered with it, which appears to stain the brood-combs and surplus combs; also if they are built out and partly or wholly filled. This is particularly observable when there is little or no clover honey, and bees work freely on white daisy. Fortunately it does not matter so much, as the daisy honey is quite dark, or inferior, and must be sold as a low grade of honey.

In the national rules for grading honey we find in the first and second rules, honey must

est, is usually colored or soiled the most. Now, I consider the whole idea of travel-stain as a foul slander. The idea of our industrious insects not being tidy is infamous. It is true that, during winter, dead bees, chips of wax, and perhaps bits of pollen, are allowed to accumulate; but would it not be death to any bee that should attempt to carry out these accumulations, with the mercury at 32 or 40 degrees lower? Do not the bees, with the first warm days of spring, have a housecleaning that would be creditable to any house-keeper? Every nook and corner of the hive is examined, and every particle of dirt removed. Even then they are not satisfied until in the warm summer days they can give the whole inside of their hive a new coat of varnish.

But if this discolored condition of combs is not travel-stain, what is it? That is just what I have been studying for some time, and will try to explain. Let us take a comb or section of honey, with all the marks or characteristics

of travel-stain. Near the top it is of quite a light color, but gradually becomes darker, until at the bottom it is a yellowish brown. If we take the point of a knife and carefully lift a cap from a cell near the bottom of the comb we shall be surprised to find the inside of the cap, or the side next to the honey, nearly or quite as dark as the outside. We lift another and another, and find the inside corresponds very closely to the outside in color, constantly changing with the outside. How strange! Can it be that the dirt the bees have left on the surface of the combs is of such a nature as to strike clear through the cappings? Sulphuric acid would hardly do that. Now take a glass of moderate power and look at the cappings, both inside and outside, and we soon get a fair idea of the trouble. We shall find, either mixed with the new white wax, darker wax, or welded to the white wax, little particles of darker wax or propolis, or other substance not easily seen without the aid of a glass.

During the past season some interesting facts came to hand, throwing some light on this subject. Upon top of one super was an old cloth, to make it tight, with a blue lining next to the sections. When I took off the super I noticed the blue lining had been gnawed away to some extent by the bees. When I came to pack my honey I found these sections with the combs tinged with blue, some of them on one side only, while others were stained on both sides. Some were stained but slightly, while others were very blue. Except for this blue the combs would have been very white. Had the color been the same as the so-called travel-stain, I think no one would have thought it any thing else. So thoroughly was the cloth torn into atoms that it appeared as a stain on the combs.

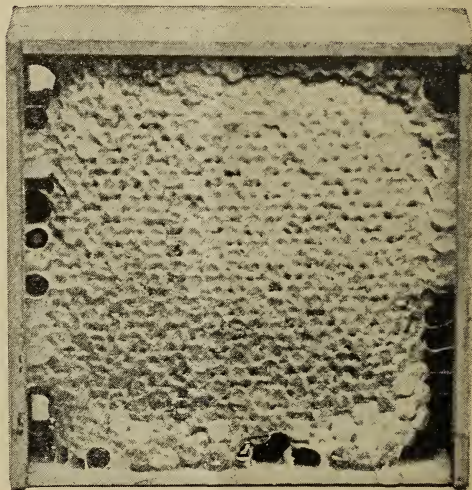
Another case occurred where the bees tore coating from enameled cloth or other black cloth, and stained the combs black.

I have sometimes been troubled with yellow cappings of crude wax on my surplus honey, caused by raising up a nearly filled super and placing under it another with thin foundation that was of rather high color. The bees would thin it, or sometimes tear it down and carry it above, and use for capping off the nearly finished combs, giving them an untidy appearance.

Bees often use considerable propolis for capping late in the season when wax is scarce—sometimes in such quantities as to be easily seen by the naked eye. Where do they get the dark wax with which to produce travel-stain? Doubtless from the brood-chamber. Perhaps the cappings of hatching brood furnish the largest share of it. The colors correspond quite closely. Here is a colony that is strong, filling and capping its first or second super. It casts a swarm. The queen's wing is clipped, and the scientific (?) bee-keeper removes her, letting the swarm return so as to secure the largest yield of honey. The hive is full of brood, and hatching at the rate of 1000 or 1500 each 24 hours. All goes well so long as there is plenty of young or matured brood to seal; but after eight or nine days the

brood is all sealed, and yet the hatching bees are throwing off from 1000 to 1500 cell-caps daily. There is but little honey in the brood-chamber to seal, or little use in the brood-chamber for the cappings. These cappings are largely pure wax discolored by long use, and it is not at all surprising that more or less finds its way to the super, and produces travel-stain, especially when honey is scarce and but little wax produced in the hive. Doubtless more or less of the wax is taken from the old combs, and mixed with pure wax for capping. There is reason to believe there is a good deal of wax shifted from one comb to another during the warm season when the wax is soft.

It should be noticed in this connection, that, in a hive filled with foundation on which a strong colony was placed in July, and has remained queenless, the combs were built out and sealed in July; and now, after more than four months, the combs have remained free



TRAVEL-STAIN ON A SECTION HONEY-BOX.

from travel-stain, even in the brood-chamber, and to-day are as white as the most fastidious dealer could desire. A good deal of pollen has been stored in the lower part of the combs; but the pollen has produced but little stain.

So far as I remember I had less of travel-stain when my bees were allowed to swarm and increase by natural swarming than when I try to keep every swarm strong whether it has a laying queen or not.

Again, it seems to me that my combs were whiter when honey was stored in large surplus boxes than in small sections. I remember very distinctly that, in changing from 2-lb. sections to 1-lb., the combs seemed to have more travel-stain—that is, were not as white as the 2-lb. sections had been. It may have been something in the season, although I feel quite sure it was not.

Now, from the foregoing it would appear that we are likely to secure our whitest combs from hives having new combs, even if such

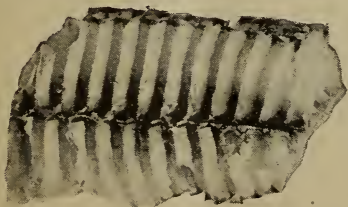
hives are queenless. Hives having old combs will be more likely to produce whiter combs with a laying queen than without, especially if the colony is quite populous. Of course, when honey is abundant the combs will be capped whiter, as bees appear to dislike to change honey into wax when it is coming in slowly, and will "rake and scrape," as the saying is, to get wax with which to seal their nearly finished combs, and do not object to brood-cappings or small chips of old wax from the brood-chamber, or yellow foundation wax, or even a little propolis or bits of cloth, for this purpose.

I believe bees will make wax and weld it into comb faster when they can cluster together in large numbers than when compelled to cluster in small bodies; hence, the larger our receptacle the whiter our combs, other things being equal. The value of the open fence for separator comes in here; for, while the combs are built between slats of wood, in small receptacles, yet the partition is so open that the bees can cluster in a whole row, and can communicate with each other almost as freely as though there were no fence between. The past season I had 2000 or more plain sections that were filled between fences, and I know it would not require an expert to see that they would average whiter than those built between solid separators. I believe the fence may be safely recommended as being helpful in procuring the whitest combs.

Without doubt a young queen would be useful, as the bees would be more likely to use the bits of soiled wax they might find in the brood-nest for sealing up the brood than to carry it above for use in surplus combs. Of course, combs should be removed from the hive as soon as possible after they are finished, to prevent dark wax being added to the cappings.

Conditions may vary in different sections of the country. I have written what seem to be the facts in these parts. If others will study this subject in other sections we may be able to establish rules that may be very helpful to us all.

Of the photographs I send you, one is a brood-comb from a hive with new foundation in which a strong colony of bees was placed



early in July. Evidently the queen was in some way lost, as no brood was reared. It was broken up in November, the combs showing very little or no travel-stain, after being four months in a populous hive.

The photo of a section shows a case of what I suppose to be the so-called travel-stain, but not an exaggerated case. The stain was slight,

but quite apparent. The piece of comb shows stains in center of comb instead of cappings.

Middlebury, Vt., Nov. 26.

[When Mr. Crane was in Medina recently we talked a good deal about this matter of the so-called travel-stained honey. I confess that I myself had believed that discoloration was due to dirt that the bees had carried in on their feet. Of course, I was aware of the fact, as all bee-keepers have been, that comb honey produced next to an old brood-comb is quite liable to be discolored; but I was under the impression that this discoloration was altogether different in character from that of the ordinary travel-stain, so called.

After writing the article Mr. Crane looked over considerable of our honey, with the result that his convictions were, as set forth above, confirmed. Indeed, he showed me the cappings that he had taken from several boxes that showed the discoloration going clear through.

This year there has been more travel-stained honey on the market than usual, owing, no doubt, to the poorness and lateness of the season. In fact, nearly all the honey we have purchased has been rather off in color, although the flavor was good.

There may be some wisecracks in our profession who knew all these facts before; but I am sure that at least a general impression has prevailed that the bees had a fashion of running through their supers with soiled feet, and that it was not wise to leave honey on the hive for too great a length of time.

I have often wished myself that we could leave our comb honey on the hive a little longer, and have been in the habit of leaving that for our own home consumption on the hives longer; and it is a fact past gainsaying that the honey so left acquires a richer flavor. I can not now remember particularly whether the honey that I had reserved in this way for our own use had darker cappings; but if Mr. Crane's theory is correct, the off color, if any, would not be due to the prolongation of the time the honey was on the hive.—ED.]

..... "DOOLITTLE'S LATEST FEAT IN QUEEN-REAR- ING."

Doolittle's Method of Queen-rearing, in a Nut-shell.

BY G. M. DOOLITTLE.

Before me lies the following letter: "I read in November 15th GLEANINGS Doolittle's latest feats in queen-rearing. I have his book on queen-rearing, 1889 edition. Has he any improvement over plans there suggested? I practice many of his plans; but my experience nine years ago, in rearing queens in hives containing queens, was not very satisfactory. I want the latest.
R. WILKIN.

"Newhall, Cal., Nov. 30, 1898."

The above is a letter written to The A. I. Root Company, and forwarded to me to "draw me out," as there seems to be a thought on the part of many that Doolittle is not now

practicing, for queen-rearing, just what he gave in "Scientific Queen-rearing" about ten years ago. As the Roots and myself did not think Bro. W. would have any objections to having his letter appear in print they have taken the liberty of publishing it, and I have taken it as a text to tell the readers of GLEANINGS, and Bro. Wilkin in particular, just how those "600 sealed cells from that one colony, the queen laying all the while," as Dr. Miller puts it in "Stray Straws," were reared. These queens (for every cell hatched out a perfect queen) were reared just the same as I gave in the "1889 edition" of my book, and just as I rear 999 out of every 1000 queens, for I practice no other plan, not even saving natural swarming-cells, for, as a rule, they do not prove as good as those reared by bees in an upper story, with a laying queen below all the time.

Now, lest some one may think this is a "puff" for my book I wish to say that I have had nothing to do with the book since it went into the publishers' hands; for at that time I sent it free and broadcast over the world, with the hope that it might do the world some good, not having any pecuniary interest in it since, nor any other, except that it is my "baby." It has been a "loss to know" matter with me for a long time why a few did not succeed with a plan which is so perfect in my hands, and to me seems so simple withal; and all I shall attempt to do in this will be to go over the ground given in the book a little more minutely, as I have no improvements over what is there given. Since I gave the book to the world I have paid very little thought to queen-rearing, my whole life and experiments since then being put into studying about the non-swarming of bees; and if I ever succeed along this *non-swarming* line, Providence sparing my life, I shall give that to the world in book form also. With this long preliminary I will proceed to tell "just how I rear queens."

When spring opens I select one of the strongest colonies I have in the yard, and one having a queen reared the summer before, as I wish one which is not liable to fail in her egg-laying powers before the season is over, as that *laying* queen below has very much to do with queens of the *best* quality, in my opinion.

About the 10th to the middle of May I go to several hives till I find the number of combs of *sealed* brood that are necessary to take the place of those having no brood in them in the hive I have selected, which is generally from two to four. These combs of brood (without bees) are now set in the hive, when in a week or ten days I have a colony strong enough to commence operations. Perhaps I should say just here that I use nine Gallup frames in this hive, which is a *chaff* hive, and that I bring from my out-apiary, the fall before, the queen to rule over this hive, which is a mismated (or "hybrid") queen, as generally called, for I find that hybrid bees, showing about as many black bees as those with yellow bands, will build and complete nearly double the number of cells as will pure Italians, and seem to take to this line of work better than any other. I usually bring several queens of this class to

take the place of those sold, and then select the strongest colony having one of these queens. As soon as the selection is made the rest are used in the out-apiary again. I tell this only as I wish to give every thing just as I do it.

As soon as the colony is strong enough to go into the upper story I take two combs from below, having *mostly* eggs and unsealed larvæ in them (don't take any drone larvæ, as drones above a queen-excluder are always a nuisance), and in their places put two combs of sealed brood from other hives, as we wish all the bees possible thus early in the season.

I now put on top of the hive a hive having a queen-excluder *nailed* to its bottom (if thus nailed we never have to touch the excluder if we wish to remove the upper hive during the season), as it always comes off with the upper hive, and in the center of this upper hive put the two combs of brood, four frames well filled with honey, a division-board feeder, and two dummies made from inch or $\frac{3}{4}$ lumber.

When about two days have elapsed for the colony to adjust itself to the new conditions, it being fed about a pint of *thin* sweet every night, if honey is not coming in from the field, they are ready for a batch of prepared cell-cups, as given in my book. To tell all about how to prepare these would be too long for this place; but all can find all about the matter by turning to chapter 7 of the book, and I could not tell that part any better were I to try it over again.

Before going for the royal jelly and the larvæ to transfer into it, I stop at the hive, take out one of the dummies, shove the frames that way till I leave a frame's space between the combs of brood, when the cover is put on. As a rule it takes me from 15 to 20 minutes to get the royal jelly, the larvæ, put the jelly and larvæ into the cell-cups, and get the now prepared frame to the prepared hive. I now remove the covering (which is a quilt, with a 4-inch sawdust cushion over it, and a hood or cap eight inches deep over all), when I find the space left for the prepared frame completely filled with bees—so much so that I have to work the frame slowly up and down in lowering it, so as to cause the bees to run out of the way. I don't know that causing the bees to cluster in this vacant space between the frames of brood has any thing to do with the matter; but it has always seemed to me that they are better prepared with royal jelly and for queen-rearing by doing so. Three days later I go to the hive again, take out the other dummy, draw the frames to the side of the hive till I come to the first frame having brood in it, when I lift the frame of cells, take off one or two of them, for the royal jelly needed to start the next "batch," when the frame of cells is placed in the vacant space behind the frame of brood, caused by taking out the dummy and drawing the others along, thus preparing the same place for the next frame of prepared cell-cups which the first one occupied, and when all ready it is placed there as was the first. Three days later a frame of honey is taken out from the opposite side from which the last dummy was taken, the frames again

drawn along till we come to the frame of brood, when the last prepared frame of cells is taken out, one or two taken off for royal jelly, and the frame "jumped" to the outside of the frame of brood, which gives room for the third prepared frame between the frames of brood again, where it is placed as soon as prepared.

As I do not work with the bees on Sunday I time it so that no cells have to come off that day, and so four days now elapse before I put in another prepared frame, which makes ten days from the time we started, so that we really have only three prepared frames every ten days.

I now take out the frame of "ripe" cells, or the first one prepared, and distribute them where wanted, getting the bees off, etc., as given in chapters 8 and 9 of the book, when I lift out the two frames of brood, look them over to make sure that the bees started no queen-cells on these frames (unless this is done we *may* have a queen hatch when we least expect, and destroy all of the cells on the other prepared frames), when these two frames of now sealed brood are "jumped" over behind the two frames of cells now remaining. I now take out a frame of honey on each side, and shove all the frames along toward either side of the hive, so as to make room for two frames containing eggs and larvæ, taken from any hives in the yard (generally from nuclei when under full headway later on), which are placed in the center of the hive again, as the first two were, being left apart for the fourth prepared frame, which is now fixed as was the others, and put in.

This tells you all there is of it, only that you keep right on in this way all the season, and the result should be with you, the same as I gave on page 849 of Nov. 15th GLEANINGS. I see the Roots use colonies preparing to supersede their queen, but I have not used such a colony since the book was published, and do not see why others can not succeed as well as I do with a *good* laying queen below, for I do not believe that the raising of queens in this way is any "trick" at all. Colonies worked as above given are quite likely to swarm under the pressure of bees given by their own queen and the inserted brood; and when they do so I simply take off the upper story, cut off all queen-cells started, cage the queen for ten days, cut the queen-cells again, and allow the bees to liberate her by eating out the candy from the stopper, as given in January 1st GLEANINGS for 1898.

As to feeding: I feed generally, to start with, till the frames in the upper story are quite well supplied with honey, unless honey is coming in quite freely from the fields, after which I rarely feed at all unless at times of real scarcity. That is, when enough is coming in from the fields so that no robber bees are about looking into hives as I open them, I do not feed, only for the first ten days, but feed at all times when nothing can be obtained from the fields.

Then there is a bare possibility that the deeper Gallup frame has something to do with it, but I think not. I have never tried so rear-

ing queens at the out-apiary, for I use only the *one* colony at home, bringing brood from the out-apiary, if I wish to breed from any queen there.

If I have failed to make all plain, don't be afraid to ask questions, for on *good queens* hangs the greatest success in apiculture.

Borodino, N. Y., Dec. 30, 1898.

APIS DORSATA.

A Correction by Mr. Benton.

It is unfortunate that, in attempting to correct the item which you quote in GLEANINGS for Dec. 15, 1898 (page 939), from the *American Cultivator*, you should leave the subject about as badly mixed as before. Allow me to suggest a little more charity toward the editor of an agricultural journal, when the editor of a bee-journal—even of GLEANINGS itself—in an attempt at correcting the former on a point pertaining to the history of the industry, can not make half as many statements without blundering quite as badly.

Immediately below the quotation which you made from the *American Cultivator* is your effort at correction, which reads as follows:

"Now, there may be some truth in the above, but certainly there are a lot of mistakes mixed in with the truth. Mr. Benton went originally to the Island of Cyprus, in the Mediterranean Sea. Then in pursuit of *Apis dorsata* he went on to India, and then south to the island of Ceylon. But, according to our geography, the Philippines are a very great distance from Ceylon and India, and twice as far from Cyprus. Mr. Benton did not go to the Philippines. I have thought best to copy the above, because just such blundering statements are the ones that go the rounds of the papers."

Although it is now eighteen years since I made the journey which Editor Root mentions, and though, since then, I have made many others, the recollections of that particular one are still quite distinct; nor do I need, for that matter, to depend upon memory alone, for, besides certain published accounts which appeared at the time, some in European and others in American aparian journals, I have memoranda and notes of travel which settle beyond doubt the question of the route taken. Incidentally I must remark that it is a rather "queer" geography you study if it teaches you that "the Philippines are twice as far from Cyprus" as Ceylon is! It is about 4500 miles from Cyprus to Ceylon, and 2800 miles from Ceylon to the Philippine group. Nineteen days (exclusive of stops) were at that time usually consumed by the most direct route in making the first-mentioned journey, while ten to eleven days sufficed for the trip from Ceylon to the Philippines. And the distance from the Malay Peninsula, forming a part of Farther India, to the Philippine group, is but 1000 miles.

As to the route taken in my journey, I wish merely to state that it was not first "to India and then south to Ceylon," nor have I ever

known of any one's making that statement until you did so. From Cyprus I went first to Syria and Palestine; thence I proceeded by way of Egypt and Arabia to Ceylon, examining and collecting the bees peculiar to each region visited. From Ceylon the journey was continued to Farther India, Sumatra, and Java, that having been the original intention when I started from Cyprus. On the large island of Java, 600 miles long, I made journeys in search of *Apis dorsata*, east, west, north, and south—in fact, everywhere—by rail, by coach, and on foot, over plains, plantations, rivers, wooded hills, into the wildest jungles, and up the most rugged mountains and active volcanoes, even to a height of 10,000 feet; but neither secured nor even saw any of the giant bees, although they had been supposed to be plentiful on that island—so plentiful, in fact, that certain German publications had, whenever referring to them, always called them “the large bee of the Island of Java.” On my return I again visited Farther India and Ceylon, and in the interior jungles of this island secured four colonies of *Apis dorsata* which I brought with me alive eighteen days' journey by fast steamer to Syria. These giant East-Indian bees showed not only great vitality under very trying conditions, but also gave indications of qualities which I think it worth while for the intelligent bee-keepers of America to investigate further and without prejudice.

FRANK BENTON.

Washington, D. C., Dec. 31, 1898.

[While the mistakes may have been rather provoking to friend Benton, I really feel that they did him no injustice. I meant more to mention the places he visited than the exact order in which he reached them. The blunder I sought to correct was that he went to the Philippines to get *Apis dorsata*, instead of to Ceylon and Java. So far as the distances are concerned, I referred to air-line or straight distances, while Mr. Benton evidently refers to the distance one must travel to reach the several places mentioned, which is quite a different thing. When blunders result in bringing out so interesting a letter as the above from one who has traveled further than any other man ever did for knowledge regarding bees, I feel pretty well reconciled, and hope friend Benton will pardon any discrepancy between my statement and his.—W.P.R.]

BATTLING WITH FOUL BROOD.

Ten Minutes' Boiling of Diseased Honey not Sufficient to Kill the Germs; a Valuable Article.

BY J. A. BUCHANAN.

Four years ago foul brood made its appearance in my home apiary. This was expected to occur at any time, as we buy honey from bee-keepers in nearly every State in the Union. Each colony becoming affected was destroyed, the honey extracted, and, if good, was sold, the combs made into wax, frames boiled, and stored for future use. This apiary of 80 colonies was wiped out within three years after the first appearance of the disease.

By way of experiment, twelve colonies remaining were taken from their combs and given new clean hives, there being small starters put in the frames, and after the bees had built combs three days these were removed, and full frames of foundation given. This was in July, at which time but little honey was to be gathered. In order to have the hives filled with comb, brood, and stores for winter, the bees were fed syrup with enough honey added, which was taken from out-apiaries free from disease, to insure against granulation.

The time arriving when larvæ and sealed brood would be found in abundance, it was with no small degree of interest that examination was made of the brood-nest. Beautiful sheets of perfectly healthy larvæ greeted my eye as comb after comb was lifted from the hives; and as the thousands of young bees left their cells not a trace of foul brood could be found.

About this time I read in some paper—may have been GLEANINGS—an article stating that the spores contained in foul-brood honey could be destroyed by boiling for a few minutes, after which it could be given to the bees again with perfect safety. To me this appeared logical and reasonable. As I had a few 60-lb. cans of diseased honey that was too dark to sell I was glad to utilize it in giving it back to the bees. Fifty pounds of granulated sugar and twenty pounds of water were brought to a boil; then two hundred pounds of this diseased honey was poured in, and all brought to a boiling-point, and kept at this for not less than ten minutes.

The greatest care was taken that not a bee could get access to any honey until it had been boiled. This honey was now safe for bees, and each colony was fed on this until well supplied for the winter. Of course, brood-rearing was stimulated by this liberal feeding; but there was something else stimulated, and every colony was again soon rotten with foul brood; and you may know I was stimulated up to a point where I could have taken that fellow who told “all about” how to kill foul-brood spores by boiling honey five minutes, outside the camp and stoned him off the earth.

As further evidence that this honey so treated was the sole cause of the trouble I had three late swarms, six miles away, in an out-apiary, that were light in stores. A quantity of this honey was taken out there and fed to them. All three soon had the disease. These were at once brought home; but as it was late in the fall, and having plenty of bees, these three came through the winter in fair shape; and, notwithstanding their diseased condition, they were ready to divide by the middle of May.

They also furnished me with material for further experiment, with a view to learn how to stamp out the disease with the least possible loss to the bee-keeper.

By stimulative feeding, and the best of care, these three colonies had all cast swarms by the 20th of May. The swarms were allowed to build combs two or three days, when these were taken away and full sheets of foundation given.

As fast as the young queens in the parent colonies hatched they were caged in order to hold the bees together until about all the brood that would hatch had done so. Then their combs were taken away, and bees treated the same as the swarms. Evidently there could be no trace of foul brood left; but as there was no honey to speak of in the field, my bees could not make any advance unless fed. I had a good deal of honey yet, but full of spores; so I decided, just to find out something further, to feed this honey back to the bees. Now, don't say, "What a fool!" until I get further along. I put a large boiler on the furnace. I put in water, then sugar; this was done to prevent the honey afterward put in from burning, and to thin it somewhat. The honey and all was boiled for one hour, all the while keeping the scum arising skimmed off. When strained and cool it was fed to the bees. Any more diseased brood? Not a particle. In a few weeks each colony was again divided, and I had twelve strong stocks from the three diseased ones I had to work from in the spring.

The advice to burn hives, frames, bees, and honey is all wrong. I feel sure that, with the experience I have had, this terrible malady can be stamped out with but little loss to the bee-keeper, if it is only undertaken in a determined, painstaking way.

Your remarks, Mr. Editor, in footnotes to Dr. Miller's article, page, 876, Dec. 1st, have called out what I have written above.

Holliday's Cove, W. Va.

[On page 876 Dr. Miller, on the authority of Mr. Genonceaux and Dr. W. R. Howard, stated that it was not safe to feed infected honey that had been boiled only 15 minutes; and he further added that later experiments on a more extensive scale by Bacteriologist J. J. McKenzie were to the same effect. These scientific experiments not only showed that 15 minutes' boiling was insufficient, but that even 45 might not be enough. In reply to this, I strongly intimated that science was at variance with practice, as many bee-keepers had had honey boiled only a short time, and yet no bad results followed. I then said: "This is an important matter, and we can not afford to make any mistakes. If there is just *one* bee-keeper who has found that five minutes' boiling is not enough, then we ought to advise boiling for at least an hour to make sure."

This was a challenge, for it seems to have been accepted by at least one bee-keeper whose testimony we can not doubt. His statements, together with those of the scientists above named, convince me that it is dangerous to use foul-brood honey that has been boiled for less than an hour. Nay, I will go further: I believe one will be taking risks if he feeds such honey if it has been boiled for less than *three* hours.

I am willing to admit that this is contrary to my own teachings and recommendations in the past; but when I see myself so plainly in error I am willing—yes, glad—to have to "right about face."

On the other hand, I feel just a little cha-

grined for the part I have borne in insisting that a few minutes' boiling was sufficient. But I believe I was backed by the experience of such men as R. L. Taylor, Thos. W. Cowan, D. A. Jones, and dozens of others. But just *one* instance, where ten minutes' boiling was found to be insufficient to prevent the spread of the disease, is better than dozens of instances where the ten minutes' boiling was found to be attended with no bad results. While one may drive safely within an inch of the precipice, it is the part of wisdom to drive just as far away from the edge as possible, even if we have driven hundreds and perhaps thousands of times along the very brink.

This article, it seems to me, ought to be scattered far and wide, for it is high time we were unlearning some of our old knowledge on the question of foul brood.—Ed.]

A PLEA FOR THE COLD-BLAST SMOKER.

Hot Smoke vs. Cold; Construction of the Ordinary Cold-blast Smoker Faulty; How it should be Remedied; the Modern Improved Shipping-cases.

BY C. DAVENPORT.

One of the cheapest and most effective methods known for subduing bees is by the use of smoke; and with but few exceptions it is the means exclusively used for this purpose; but I believe smoke alone is much more efficacious for the purpose of inducing bees to fill themselves with honey than smoke and hot air combined are; and while, from private correspondence and conversations with bee-keepers, I know I am not wholly alone in this opinion, I do not remember ever seeing any thing in print to this effect; but I have that which is opposite. The effect of a blast of hot air on bees is to make them appear crazed or frenzied, either with rage or fear—perhaps it is both—and, instead of trying to reach and fill themselves with honey, many of them, if it is so they can easily, are apt to take wing and hover annoyingly near the operator, if they do not make a frenzied attack, which they are very apt to do in a short time.

The effect of smoke and hot air combined is, of course, different still. The same effect can be noted, but in a much less degree. The effect of smoke alone is to excite and alarm them, either in a less degree or different way; for, instead of rushing and flying frantically about to avoid it, their one desire seems to be to fill themselves with honey. The effect of smoke combined with a blast of cold air is about the same. For these reasons I prefer a cold-blast smoker; for, while a hot-blast one is more effective for the purpose of driving bees from a super or off extracting-frames, especially if the fuel is of such a character as to create a good deal of heat as well as smoke, this, at least with any one who uses escapes, is of much less importance than the main purpose of inducing bees to fill themselves with honey; and experiments made, as well as the use of both hot and cold blast smokers, convince me that a cold-blast smoker is more ef-

ficacious for this; and while it may be said that, if a hot blast is held some distance away, the effect is the same as a cold one, there are many times when it is not practical to do this, especially in a strong wind; and in other cases if it is held far enough away to give the effect of a cold blast the strength of the blast is not strong enough to drive the smoke as far as it may be desired it should penetrate; and I believe the continued and especially the injudicious use of a hot-blast smoker in a yard has a more injurious effect on bees, not only in disturbing them worse, with the consequent effect of less honey being gathered, but they appear to me to become crosser, more excitable, and more difficult to subdue and handle; and while there is no doubt of this in my case, my manner of handling bees makes this more apparent and real with me than with those who follow the orthodox method of blowing smoke in at the entrance of a hive, then waiting awhile before operations are commenced.

If what I have said so far has been carefully read it will be understood why, when I explain that, as a rule, when I desire to handle a colony, the cover is removed and operations commenced at once without any preliminary smoking and waiting.

Another thing in favor of cold-blast smokers or breech-loading ones is that they are easier to fill and light; for instance, the directions that accompany a well-known make of muzzle-loading smoker say that, when it is desired to start a fire in one, we are to get a few coals of fire out of a stove and drop these in first; then the fuel on top of them. This is an effective way to start a fire; but at my ranch, in warm weather, when a smoker is most in demand, there is very seldom a fire in a stove; for I have not one kind of queen; and instead of cooking my own meals I prefer to pay for the privilege of taking them at a neighbor's. But if the case were different, and I had as many of these queens as the newly elected member of Congress from Utah is said to have, and a like number of stoves going, I often wish to use a smoker for so short a time that I can light a breech-loader and have the work finished or well under way before a fire could be started in a muzzle-loader, provided the directions accompanying it were practiced, and it is to be presumed that the makers of an implement understand the best method to be followed in using it.

The fuel for a smoker that I prefer, and one that is easily obtained here, is flax straw. This, if free from foreign matter, such as weeds and the like, and thoroughly dry, is easily lighted with a match, gives a good volume of smoke, and will seldom go out until it is all consumed; and in a smoker of the right size, properly made, one filling will last from an hour to an hour and a half, depending on the amount of smoke required in the work being done. While there are cold-blast smokers in the market, there are none that are properly made. While the principle on which the Clark is made is effective, the barrel is too small. It should have a fuel capacity at least equal to any of the leading makes of muzzle-

loaders, and the fire-chamber should taper but slightly, if at all; and, most important of all, while it should remain a breech-loader it should have a detachable nozzle so that, by removing it, the holes in the portion in front, as well as the air-tube, could be easily cleaned of soot and the like. As now made it is a difficult matter to clean them, and these parts frequently need cleaning.

I believe that if a smoker were made on these lines it would, when its merits become known, supersede the sale of any now made, especially when the relative effects of hot and cold smoke are carefully noted by bee-keepers.

While my opinion is that the manufacturers of our goods will not encounter such a rush for supplies during the coming season as they did the past one, I believe the firm GLEANINGS represents will notice a gradually increased demand for their shipping-cases owing to late improvements in their construction. Heretofore I have used but few of their make, for I did not consider those made for standard-size sections wide enough, for I want a case made so that, after the last row of sections is in, there will be room for a follower, with a small space between it and the back side of the case. This space is packed with folded paper, and it is much easier to pack honey in such a case so the sections are held firmly together, which insures greater safety in shipping or in carrying them around; and the dealer who retails from the case finds such a one more convenient, for, after removing the follower, there is room to remove and replace a section from a full case easily. The past season I ordered 50 of the Root Co.'s make, and found them not only as wide as I desired, but also supplied with followers; and another decided improvement I found in their construction was that the upper strip that holds the glass in front, as well as the back side of the case, came up just even with the end pieces, which allows the cover to project out, or cover the whole of the case instead of fitting down between the back and front side, which it did as they were formerly made; and when made in this way, no matter how accurate the workmanship was, there was some chance for dust to enter the case, even when the sections were covered with paper; for the back side of a case, when it is packed, naturally spreads or springs back enough to leave a small crack between it and the cover unless the latter reaches over all. As these cases are now made, I for one can see no chance for improvement unless to have the paper a little heavier and cut a trifle larger, especially the pieces to put over the top of the sections; but this is a small matter; for, except for appearances when opening a case, it is immaterial, with the case and cover as now made, whether the sections are covered with any paper at all.

Southern Minn.

[It may be you are right; but my own experimenting, and much of it on a large scale, has led me to opposite conclusions. After experimenting, and trying all sorts of construction, and having made and thrown away doz-

ens and dozens of different smokers, I came to the conclusion that the hot blast suited me the better. This conclusion was based on the following: Greater volume of smoke, for the reason that the cold blast will not produce a hot enough fire to produce a smudge that is conquering to the fullest degree. It takes heat, with most of the fuels obtainable, to produce a great amount of smoke, and to get that heat it requires a forced draft *through* the fire. I constructed a large number (or, rather, I had them constructed) in our shop, of different smokers. Some of them were almost on the same line as is described in your letter. I found, when I got the fuel in the cold blast burning briskly after much coaxing, that I could throw as much smoke as with the hot-blast smoker; but it took too much working of the bellows, and the effort and time wasted were too great. In other words, I could, with half a dozen whiffs of the hot blast, produce *more smoke* than with five times the number with the cold blast.

Years ago the value of *cold* smoke was discussed, and it did seem to me that smoke pure and simple, without heat, would be decidedly preferable; but in tests that I made I found I could conquer bees sometimes, even with hot air alone, without smoke. As a rule, hot air and smoke combined were more effective than either one of them alone. In my experiments I used some vicious Cyprians—bees that were almost unconquerable. I know that once or twice I tried to subdue them with a cold-blast smoker; but I had to give up the job, and then I went at them another time with a hot blast, and conquered.

The first four or five years of my experience in the apiary was in the use of cold-blast smokers exclusively. I was then of the opinion that this was the better principle; but later, after I began using the hot blast, I found that the smokers of this class would give their greatest smoke with four or five whiffs of the bellows, and consequently were sooner ready for work.

Now as to the construction of smokers you refer to. I have made them with larger tubes and with smaller tubes; with tubes removable; with fire-boxes of the same capacity as the hot-blast arrangement, but with results as above given.

We are now and have been for years selling both kinds of smokers; but I have had a feeling that the cold blast was so inefficient, as compared with the hot blast, that we owed it as a duty to the fraternity at large not to offer the cold blast at any price. This feeling has not been shared by my father; but the different boys who have come into our apiary to work have been given their choice of smokers, and I think that, without exception, they have selected the hot blast after a few days' trial of the two kinds of smokers.

The modern shipping-case to-day as sold by us is the result of the combined thought of bee-keepers and commission men alike. In my travels among bee-keepers I usually try to get "pointers," and the shipping-case has received, among other things, its fair share of attention. It was Capt. J. E. Hetherington

who first began the use of cleats in the bottom of the case, with paper tray, I believe. I think he used cases, thus prepared, for years before the general fraternity came to know them. Finally a prominent commission house that I visited urged upon me the very great importance of having cross-cleats in the cases, saying that, if we once began to make them in that way, every manufacturer in the country would be forced to make the same kind, as bee-keepers and commission men alike would be quick to see their merits. I went home, and, as a result, shipping-cases were sent out having cross-cleats and paper trays, and the result was almost wonderful. We got orders for shipping-cases from sources hitherto unknown to us; and the following year all the manufacturers made cases on these lines.

The follower was made, not so much to facilitate the removal of sections as it was to permit of the use of different widths of sections in the same case. The time was when every width of section required a special case; and the dealer and manufacturer were put to no little annoyance, as every odd width required an odd size. Now a few standard cases will take in every sort of section, so far as width is concerned, on the market. In some cases there may be more folded paper back of the follower—in others, none at all. In still others, the follower may be omitted entirely. —Ed.]

RAMBLE 159.

Preparing Chunk Honey for Market; Experimenting with Solar Wax-extractors; Size and Shape of Brood-nests.

BY RAMBLER.

A poor season for the production of comb honey always leaves more or less of the sections only partly filled and partly capped; and many of our sections having drawn combs that were not leveled down properly presented a surface quite dark in appearance. In fact, we had but a small amount of strictly first-class comb honey, and that was stored in sections that were leveled down to within about $\frac{3}{8}$ inch of the septum.

The late Mr. Levering had a fair sale for honey put up in round tin cans holding from five to six pounds of honey. Comb honey was cut from those 12-lb. boxes, and fitted into these cans, and extracted honey turned in to fill up the vacant space. Having several dozen of these cans on hand, our incomplete sections were taken in hand, the honey cut out and fitted into the cans, and it would not do to tip these cans sidewise at too much of an angle, for, being provided with a loose cover, the honey was liable to drip from the top. Those who handled the honey in these cans complained about this feature, and claimed that much honey leaked out when the cans were taken to a distant market.

The cans, and how we took the sections *in hand* to fill them, is shown very well in the photo.

As an improvement upon this style of pack-

age, the judge sent for several dozen five and ten pound cans with a screw cap. These worked very well for extracted honey; but it seems that people will *never* become educated to the fact that honey will candy; and right here in Scott Valley, where so much honey had been sold, there are people who do not know how to liquefy it. That some foreign countries demand candied honey is evidence that they have been subject to a long training, or else they consume more honey, and are more familiar with its characteristics.

When the judge and I came to this apiary we found that there was no sun extractor for rendering wax. The only extractor for this purpose was the little steam extractor that is designed to be placed on a stove. These

June and July it was from 80 to 100—plenty of heat for our purpose.

During some odd moments in the past I had been thinking of making a wax-extractor that would melt the honey from cappings and not discolor it. The ordinary sun extractor in our hot climate heats the cappings so intensely that the honey is literally boiled; and even white sage honey is colored to the hue of ordinary molasses, and the original flavor is ruined. My idea was to overcome this defect in the sun extractor, and make it render white honey from white honey cappings.

The ordinary California wax-extractor, of whatever length, delivers honey and wax at the end. I reversed the incline, and allowed the material to run out at the side. The ex-



CUTTING OUT COMB HONEY AND CANNING IT.

steam affairs may be useful to a bee-keeper who can count the number of his colonies on the fingers of one hand; but in an apiary of one or two hundred colonies they are worse than useless, for it takes too much time to get the wax out of them.

The judge and I agreed that we should have some sort of sun extractor. We knew it would work well here; for, although we were in a mountain region, we found the sun's rays pouring down upon us for a few days at the rate of 106° in the shade. Ordinarily, in

tractor I constructed was 4 feet in length and 2 in width, while that portion holding the cappings was 18 inches; and the honey dripping off the side had only the 18 inches to run, while, by running to the end, it would have 4 feet, and hence much more heat to endure. The photo will give an idea of the way the extractor operates. Honey is so thoroughly incorporated with the bits of comb when we take it from the uncapping-box that no amount of ordinary straining will eliminate the honey. A great amount of heat, or mild heat long

continued, is the only remedy, and I found that my side delivery of the honey was inadequate to save the honey from being somewhat darkened. While conducting my experiments I noted that, one day, when there were light clouds obscuring the sun, the honey rendered out that day was not darkened at all. The heat was just right to melt the honey and not render the wax. It occurred to me that, if I could put a cloud over the extractor on a bright day, it would work fully as well as clouds a mile high. Therefore, referring to the photo, you will see my cloud which on that day was improvised from a heavy gunny sack. I found that the degree of heat on one day needed a heavier covering than on another day; and now, to make the heat more uniform, I would secure my cloud a few inches

I had a large amount of old scraps of combs, and combs from hives that were riddled with moths. They were all rendered through this extractor. The slumgum was saved, and at the close of the harvest this was boiled thoroughly, and from a large amount of it I secured 10 lbs. of wax. It paid well for the day's labor.

With the last extracting of honey I delved again into the brood-nest of those tall hives to find out if the bees had filled those empty frames, and to see if there was a good supply of honey on hand for the winter. When we try to get at the brood-chamber of this hive we find it no small job. The upper extracting-chamber can not be lifted off, so we have to take out those frames one at a time, and place them in a box where robbers will not



RAMBLER'S SHADED SOLAR WAX-EXTRACTOR—MANNER OF WORKING.

above the glass, with a large uncapping-box with ample drainage, and a little fussing with the shade to the extractor. Nearly all of the honey can be thus drained out and not discolored. There is a small per cent that will stick to the cappings, and come out only with the wax, and is much discolored.

Running the contents off at the side makes it necessary to provide a long box in which to catch the honey and wax. As a further improvement to my sun extractor I would make it still wider, and provide for caking the wax by sun heat.

There are others who are experimenting in this direction; and if they would have their ideas illustrated and described I am sure the readers of GLEANINGS would be benefited.

molest them. I was pleased to find the bees had filled a good share of those empty frames that were put below, and also filled them with honey. The bees in those tall hives had evidently provided ample winter stores before going into the supers. There were quite a number, however, that neglected the empty frames, and followed the old combs into the upper portion of the hive. In all such cases a frame filled with honey was put below.

From my experience with these hives I think bees are sure to put more honey into a brood-chamber 15 inches deep than they are in a shallow hive. The brood in these deep frames, even in the height of the breeding season, hardly ever came to the top-bar of the frame, and never to the outside frames. There

was little inclination with the queen to enter the extracting-chamber. The result might be different in a good honey-flow and with young and prolific queens.

The few Langstroth hives in the apiary were better filled with brood, and produced at least 15 per cent more honey than the Harbison worked either for comb or extracted honey, and still they were well filled with honey for winter.

Having in mind the discussion about large hives I was particularly interested in a couple of 12-frame L. hives. These large hives were provided with supers of the same depth, and the bees seemed to require the entire summer to get into them, and then only the center combs were filled with honey. I can readily see that a shallow super would have worked better.

There were also about the same number of hives with frames the length of the L., but 12 inches deep, and 10 to the hive. The result from these hives was excellent, and would have been better with a shallow super. I think location has much to do in settling the question, and it will hardly do to put down an iron-clad rule as to size for all localities.

The results of our season's work were 11,683 lbs. of honey and 160 lbs. of wax, or about 50 lbs. of honey to each of the 233 colonies that were worked for honey. Our gross sale of honey was \$628.40. For the small amount we sold in the home market we obtained $7\frac{1}{2}$ to 10 cts. The greater portion we sent to San Francisco. It was nearly all best grade, and brought 6 cts. per lb. The $2\frac{1}{2}$ tons of lower grades brought $5\frac{1}{2}$ and $5\frac{3}{4}$ c. Our 160 lbs. of wax was sent to Tacoma, and netted us 25 cts. per lb. at our station.

Now I will show the disadvantage of working an apiary 27 miles from a railroad, and several hundred miles from a market. Our five-gallon cans cost us 50 cts. per case in San Francisco, and it cost 28 cts. per case to get them put down in the apiary; total, 78 cts. per case. In moving our honey out to the railroad it cost us $\frac{1}{4}$ cent per lb., and $1\frac{18}{100}$ cts. more to get it to San Francisco, or a total of \$1.41 per 100 lbs., while car lots can be sent from terminal points to Chicago for 75 cts. per 100. In the above case the railroad men apply their rule of charging all the traffic will bear, and there is no competition to prevent.

The late Mr. Levering sold all of his honey in the home market a few years ago. His comb honey sold for 30 cts. per lb., and the price gradually dropped to 8 and 10 cents. Mr. L. would take the entire year to work off his honey. He also had a team with which to reach distant markets, such as Ashland in Oregon, 25 miles away. Our only resort in a similar sale was to hire teams to take the honey out, not only into Oregon but into the various mining towns. The trip would take several days, and with a load of one ton of honey, and a week of teaming at \$2.50 per day, the price would be diminished to less than we could get in the city markets. The only way to work up these local markets is to stick by them all the year round, and have a good team to take you hither and yon over the

steep grades. I have described this matter minutely, for I have received several inquiries about this country for a permanent location, and shall have something to say about the matter, and what other bee-keepers in the valley say, in my next.



SWEET CLOVER, ONCE MORE.

[On page 893, Dec. 1, I gave place to an attack on sweet clover that I felt sure at the time was very severe and one-sided. On page 19 of our last number we gave a reply to it that may seem a little severe. But this thing is getting to be a matter of some importance. If the efforts to have sweet clover classed among the noxious weeds come from only a few who seem to have an unreasonable spite against the plant, the sooner these people are straightened up the better. Here is something from another friend in regard to the same matter:—A. I. R.]

Dear Mr. Root:—If the controversy on sweet clover is not over I offer a little more testimony in favor of it. Mr. D. Danielson, of this vicinity, is a wide-awake farmer and bee-keeper. He raises melilotus right along, and cuts it when in bloom, for hay. He considers it excellent feed for horses, as well as a good bee plant, and does not deem it a noxious weed in this fertile soil. Mr. C. Jantz, of Marion, a farmer and bee-keeper, has been raising sweet clover for several years. He tells me that he tried to get a stand in his pasture, hoping the cows would leave enough so as to reseed it; but they, instead, hunted it and kept it cropped down close to the ground. He also says that the milk and butter from sweet clover have a most delicious flavor.

I saw a patch of it at Mr. Jantz' last summer, that was, without stretching it an inch, ten feet high. I have tried to make it choke out unseemly patches of sunflower and ragweed; but this, I think, it can't do in this country. The great leaves of these plants cover the ground so completely that nothing else can come through. Though we have some nice fields of alfalfa hereabouts, I fear it is a little dry for this kind of clover; and I think that, when sweet clover shall become better known, it will prove an excellent plant for this region. S. J. HARMEING.

Marion, S. D., Dec. 27.

And here is still another:

The honey crop in this part of the country was very light. My crop was 1500 pounds of comb, 160 extracted. The only nice honey I got was in plain sections, from 114 colonies.

Sweet clover is one of the best honey-plants that I have. I am glad that some people don't know how to kill it. I have no trouble in killing it where I don't want it to grow. Stock eat it here. When pastures are short

the stock are herded on the road, and they eat it as quickly as any thing else. I don't wonder that Mr. Sawyer, of Yorktown, has trouble in killing it. I saw his place last fall, and I didn't think he had enterprise enough to kill it.

A. L. KILDOW.

Sheffield, Ill.

SWEET CLOVER; AN ARGUMENT FOR THOSE WHO INSIST THAT IT IS A BAD WEED.

When I began keeping bees, 15 or 16 years ago, there was an abundance of sweet clover growing along the railroad near where I lived; and although I knew very little about bees I took from 75 to 150 lbs. of honey per colony. A law was passed compelling the railroads to cut all bushes, weeds, etc., along their tracks, and they soon destroyed the sweet clover. Then my honey-yields shrunk to from 25 to 50 lbs. per colony, notwithstanding my increased knowledge of the business. Since coming here (three years this coming spring) I have sown 140 lbs. of sweet clover, and have very little to show for it. I have about 20 acres on my farm that will raise fair crops of rye, corn, buckwheat, etc., and I am willing to pay \$100 to have it well seeded to sweet clover. Here is a chance for Mr. Lewis A. Sawyer, or some other sweet-clover kicker.

H. J. NORTHRUP.

Jonesville, N. Y., Jan. 5.

DANZENBAKER'S CORRECTIONS; FINE POINTS IN COMB-HONEY PRODUCTION.

The symposium on fences and plain sections in Dec. 15th GLEANINGS is worth 10 years' subscription to any unbiased reader owning a half-dozen colonies of bees if he is raising comb honey to sell. It would have been worth thousands of dollars to me had I known as much on this line 30 years ago.

You were certainly exceedingly liberal in giving so much space to Mr. F. L. Thompson, who so adroitly brings in Mr. Gefaz and Weed to show that my success in securing well-filled sections is due to having the foundation fit up solid to the wood all round.

Now I wish to say to the intelligent, unbiased readers of GLEANINGS, that I *do not* approve of having the foundation touch the sections at the sides or bottom. It seems too much like air-tight compartments; and unless there are open bee-ways over the separators at the top of the super the bees will cut out the foundation, and make the passages themselves.

I want to be correctly understood as *absolutely opposed* to bottom starters. I much prefer a full free bee-space under it for the bees. Any one who has to use bottom starters to get his section built down is heading down stream, and can be sure there is something radically wrong in his philosophy and practice.

Mr. T. says, "Both kinds of sections compared should be in the same super." That is just exactly my way, and I have been experimenting 30 years, and yet I have not felt that I knew enough to herald it abroad. When I felt sure that I had some contraption that was a sure thing, and applied it to the bees, they showed up its weak points in fine style. They

are sticklers for fine points, as may be seen by a glance at the four sections on page 920. By mistake all the last year's fences in my supers are $\frac{1}{8}$ inch too high at the top edge, making it an impossibility for the bees to fill or cap the top row of cells, while the lower edge of the fences is all right. This is now corrected for the 1899 fences. If those who have last year's fences will dress off $\frac{1}{8}$ inch at the top of those that are too high, they will be all right. The right space is $\frac{3}{16}$ inch lower than the under side of the top of the section.

Bees are a little folk, and make note of little things. Man can have them do things contrary to their instincts and bee sense; but it pays to humor them. If we will get the best results in section honey, give them sections not less than 4 inches wide by 5 high, so that the finished combs when capped are *not more than $1\frac{1}{4}$ inches thick*. Use full sheets of extra-thin foundation, solid at the top, to *swing free of both sides and bottom, in warm supers, with strong colonies, always*. Less deep or wide sections are improved by fences, but they must be too thick for a pound to ever compete with the taller wider section.

F. DANZENBAKER.

Washington, D. C., Dec. 22, 1898.

MAKING HIVES BY HAND DEFENDED.

Do not entirely discourage beginners from trying to make their own hives, as your footnote to Mr. Vinal's article on page 880 would indicate to be your intention. I do not think that Mr. Vinal's statements need be discouraging, for, in spite of his statement that he has "some mechanical skill," the results do not show it. How could he spend 21½ hours in sawing out stuff for 20 hives, to say nothing of the other items given?

Taking my own case, it would have been absolutely impossible for me to buy my hives ready made. I did not have the money. Thanks to A. I. Root and his A B C book, I had the measurements and instructions to make hives, and I made them. Yes, and I made them with a hand-saw and a hand-plane too, in spite of your assumption that "no one can afford to fuss with a hand-saw;" also made the frames, section-holders, division-boards, etc., and the total cost per hive was about 55 cents—not counting time. Of course, you will say my time was not worth ten cents an hour. Well, it was not. What *is* the value of a man's time on a new farm on cold stormy days? I used very few tools in the making of these hives—saws, plane, hammer, square, and a rabbeting-plane that I borrowed—no vise nor regular bench. When I can afford to buy hives I shall certainly do so; but being able to make them has enabled me to start from 12 colonies in box hives, and multiply till I now have 45 in Dovetailed hives.

Hotchkiss, Colo.

H. L. JAMES.

[Situated as you are, with plenty of time at your disposal when you could not be earning any thing, you can make your own hives and do it profitably. No, no! I would not discourage such men as you. But, say; I'll venture you have more than ordinary skill. Any

man who can make hives with a hand-saw, hammer, and plane, and have every thing come out right, is a genius. I don't know but that we should do well to get you to come to Medina and make hives with machinery. It was I who wrote most of the matter on hive-making in the A B C—at least, that portion describing how to make the Dovetailed hive, or modifications of it. I am pleased that you succeeded so admirably.—ED.]



THE article on foul brood, by J. A. Buchanan, page 48, will bear careful reading. It seems to show beyond a doubt that a few minutes' boiling of honey does not necessarily kill the germs in honey from diseased colonies.

JUST at the last minute I am told the "Roll of Honor" department *had to be left over* until next issue. "Barney" said he didn't know but A. I. R. would be "mad" and so I am, but we will make next issue larger to take in a "good lot" of the big pile of letters on my desk. A. I. R.

I SHOULD like to know, for curiosity, whether our readers would like to have fewer long articles and more short items. I put this question a few years ago, and the general responses seemed to be, "Keep the departments as they are." What is your pleasure, dear readers?

THE temperature of bee-cellar should be watched these days. It should not ordinarily be allowed to go much above 50 nor below 40. Do not be alarmed if there are a lot of dead bees on the floor. The most perfect bee-cellar ever devised will not prevent the old fellows from flying out on the cellar bottom, and dying there.

Now is the time to put together hives, sections, and every thing else needed for next season's work in the apiary. It is bad policy to put it off. There are days in winter when the farmer or bee-keeper has a good deal of spare time at his disposal, and he ought to make these days save as much labor as possible during the rush.

QUITE an extended dialog between J. E. Crane and myself has been taken down in shorthand. I simply acted as the pump, and Mr. Crane the well of information. The matter is very readable and interesting, and will be supplemented by some half-tones showing Mr. Crane and your humble servant in very warm "Ernest" conversation. We are at present waiting for the pictures.

WE often get inquiries on how to make a bee candy for a winter feed when combs of sealed stores are not to be had. The best

candy is the Good or Scholz, and is made in this way: Mix sugar and honey into a stiff dough; allow it to stand for a couple of days in a warm place and then knead in more sugar. Granulated sugar may be used; but powdered, or, better still, confectioners', is much better.

BEES NEAR BY ALMOST A NECESSITY TO SUCCESSFUL FRUIT GROWING.

WE quote the following from Press Bulletin No. 8 of the Kansas Experiment Station, Manhattan, Kan. The italics are my own:

If bees are kept from fruit-blossoms by netting or other artificial means, the amount of fruit set is little or none. It not infrequently happens that inclement weather prevents or hinders the flying of bees during the period when the flowers are receptive. A fruit-tree, half of which was subjected to a continuous spray of water during the flowering period, produced no fruit upon the sprayed portion, but an abundance upon the other. A failure due to the above-mentioned cause can not well be prevented, but may be modified by having bees *near at hand* to utilize the short favorable periods which do occur.

An insufficient supply of bees will hinder the setting of fruit. While other insects may take part in the carrying of pollen, the fruit-raiser must rely chiefly upon honey-bees. Experience shows that, though hungry bees may fly two or three miles, hives should be within half a mile of the orchard or small-fruit patch.

I notice similar reports in almost all of our agricultural papers; and it is not only the fruit-growers, but even growers of melons, etc., that must have bees for the most successful crops. I suppose you remember what was said at Omaha in regard to the Rocky Ford cantaloupe-melon growers.—A. I. R.

THE GENEVA CONVENTION; OUR APOLOGY.

AN apology is due to the members of the New York Association of Bee-keepers' Societies, which held its last meeting at Geneva, N. Y., Jan. 11. I was invited to be present, and to read a paper on foul brood; but at the last minute circumstances over which I had no control prevented my leaving. I had my trains picked out, and paper partially prepared, so that my intentions were good. Another apology is due to these bee-keepers from the fact that we failed to publish a notice of their convention. It reached us from the secretary, Harry S. Howe, in time, but it was sidetracked with some other matter, and was overlooked till it was too late for it to appear in GLEANINGS.

I have made arrangements so that *hereafter* all convention notices will go direct to the printers, for one or two other similar notices have been sidetracked in "my pile" awaiting my attention.

If the York State bee-keepers will give me another chance I will try to redeem myself.

DEATH OF J. P. ISRAEL (SKYLARK).

THE following note, just received from J. M. Hambaugh, formerly of Brown, Ill., now residing in California, will explain itself:

Friend Root:—It becomes our painful duty to tell you of the death of our old friend and correspondent J. P. Israel, alias "Skylark," which took place last Sunday, the 1st. I will furnish particulars as soon as I receive them. J. M. HAMBAUGH.

Escondido, Cal., Jan. 8.

J. P. Israel, or "Skylark," as he was latterly known, was an occasional writer of some prominence. He wrote a series of articles for GLEANINGS entitled "Pickings by the Way," and within a year or so his articles have appeared in several of the bee-journals over his usual *nom de plume*. He was an interesting writer in both prose and poetry—his especial forte being a mild burlesque. Our readers will miss his good-natured fun-making Pickings, for they did sometimes pick things to pieces.

REPORT OF THE NATIONAL BEE-KEEPERS' UNION.

THE report of the National Bee-keepers' Union for 1898 is before us. The following is the report of Manager Newman :

Balance as per last Report.....	\$327 65
Fees from 149 members, for 1898 (3 having been previously reported).....	149 00
Funds returned to treasury.....	25 00
	\$501 65
Paid court expenses, attorney's fees, etc., in lawsuits.....	\$145 00
Printing, postage, and incidental expenses.....	53 30
Manager's salary for 1898 on 149 members, at 20 per cent.....	29 80
	—\$228 10
	\$273 55
Back salary, voted last election :	
1896—244 old members at 20c.....	\$48 80
1897—271 " " " ".....	54 20
	—\$103 00
Balance on hand, Dec. 31, 1898.....	\$170 55

A steady fire has been kept up by this society against various persons who have attempted to deprive bee-keepers of their rights, and all the ground so far gained is still ours. With the above came the report of the U. S. Bee-keepers' Union. The following is the report of Manager Secor :

On hand as per report of 1897.....	\$182 09
Received from Secretary during the year.....	62 91
Received for membership fees, direct.....	232 58
	\$477 58
Paid for printing, postage, and ex. charges during the year.....	\$ 25 15
Publishing proceedings of Omaha meeting.....	25 00
Paid E. T. Abbott, delegate to Pure Food Congress.....	60 25
Paid Eugene Secor, delegate to Pure Food Congress.....	50 00
Salary of General Manager from time of organization to date, being 20 per cent of receipts by him.....	136 13
Paid Mr. Aiken's expenses before Classification Committee.....	6 10
Total expenditures.....	\$302 63
Balance cash on hand.....	174 95

The foregoing statement includes the expenses of the Secretary's office; but as he turns over to me only the net balance after deducting his salary and expenses, the amount received by me does not quite indicate the full membership.

Respectfully submitted,

EUGENE SECOR, Treas.

Forest City, Ia., Dec. 20, 1898.

It will be noticed that the cash on hand in the treasury of either society is very nearly the same as in the other. Although the Union has had no case in law this year, its work has

been "varied and abundant" in disseminating truth relative to honey and our interests in general. In March last, Mr. Secor attended a pure-food congress in Washington, and the U. S. B. K. U. received a full recognition by the side of all other allied industries. Some four cases of attempted infringement of bee-keepers' rights were promptly repulsed. A full report will be sent free by applying to Manager Eugene Secor, Forest City, Ia.

REPORTING SUCCESSES AND FAILURES.

I notice in letters printed in GLEANINGS, reporting honey crops, a large preponderance of successes over failures. This does not coincide with my experience, and also tends to bring down the price of honey.

Reedsburg, Wis., Dec. 30, 1898.

R. C. WATTS.

I KNOW it is easier to report successes than failures, and have already referred to this same phase of human nature before. I am aware that there have been some more reports encouraging than discouraging, even in our own columns; and these reports alone would be misleading but for the fact that I have several times said editorially that this is the poorest season we have known for years.

Perhaps you ask how we know it. Largely by the hundreds of letters that come in that are never published because they are connected with the commercial department and can not very well go to the journal without making some delays in business.

But another and more accurate index of the season is the demand in July and August for packages for extracted honey, shipping-cases, and honey-labels. During the past season the call for these articles was exceptionally light in comparison with the demand for other goods earlier in the season. On the other hand, when there is a good yield, as there was in 1897, there is a great demand for all of these articles, especially labels. The supply manufacturer is, then, in rather better position to gauge the season than any one else.

But perhaps the question may be raised, "Why do you report at all the successes?" For the reason that it enables the one who did get a crop to dispose of it to some brother bee-keeper who didn't get any, and wishes to supply his old trade.

APIS DORSATA FROM THE PHILIPPINES; SOME BIG STORIES.

GOING the rounds of the daily papers is a statement, more or less modified, that in taking control of the Philippine Islands our government has obtained full possession of the giant bee, *Apis dorsata*, which bee is to be immediately brought by the government to this side of the world. So many crudities attend the statement that the intelligent bee-keeper may be excused from believing that there is very much foundation for what is said. Newspaper reporters are sometimes "expansionists" of an extreme type. Among the items appearing in an article in Toledo *Blade* are the following :

"In the Philippines a comb of honey six feet long by four feet wide and nearly two inches thick can be obtained for a few American cents." (Two hundred pounds of honey in one comb!) "The bee is about two inches

long." "The Department of Agriculture proposes to import these East-Indian bees in large quantities for free distribution throughout the country, or for very cheap sale. A farmer desiring to go into honey-making can get a queen-bee and form a swarm."

Those who are favorably inclined to the new bees, and desirous to obtain them, may feel assured that they will receive information promptly through GLEANINGS whenever any thing authoritative is to be said; and those who oppose their introduction may possess their souls in patience; for, if we are to believe those who say *Apis dorsata* would be no acquisition, we may also believe them when they say that it could not live in our climate.

A PLEA FOR CANDIED HONEY; CANDIED HONEY CONFECTIONERY.

THIS is about the time of year when we ought to begin to talk candied honey to consumers, for the simple reason there is usually plenty of it. We have quite a trade from our factory help that prefer honey in this form to any other. We keep on hand the best grades of comb and extracted—the latter in liquid and candied form; but the solid article not a few take in preference. I suppose it is because it is more of a confectionery—something one can chew as he would some choice chocolate bonbon. There is really something about candied honey that I like myself; especially do I prefer it when spread on bread and butter, because I can "put it on thick." We asked one of our employees with a big mustache why he preferred candied honey. "Because," said he, "I can eat it without having my mouth all smeared up as it is liable to be with the other stringy stuff."

R. C. Aikin, it will be remembered, has worked up quite a trade in candied honey in tin pails. His trade has been educated to like it. The Dadants have also developed a large trade for the same article. They put it, when liquid, into the Dadant pails; and when candied and labeled, to show how it may be brought to the liquid form, it is ready for market.

Suppose you try an experiment in your own family. Put three kinds of honey on the table; and if the candied has not been on the table for a month back, just see how quickly it will be taken in preference to the other two.

As you meet your customers, always mention your candied honey. Ask them to try a sample. You will be surprised to see how they will call for more.

I think the main reason why the candied article does not sell in the open market is because the average consumer imagines it is "sugared," or not pure in that form; but if he once understands that it is genuine honest honey we shall see a marked demand for honey in that form in the markets generally.

Some efforts have been made in the past to make a confectionery of candied honey alone. The honey is allowed to become solid, when it is sliced up into small cubes, and wrapped up in paraffine paper; but before putting it in the paper it is allowed to stand a few days to

permit the liquid portion of the honey to drain off, and that reminds me that candied honey is the very best there is. The inferior portion of the extracted will drain off, or remain liquid. Just pound that fact into the heads of your customers.

THE LANGSTROTH-MONUMENT FUND.

QUITE incidentally I happened to mention in one of my letters to General Manager Secor, of the U. S. Bee keepers' Union, that we had had indifferent success in raising funds for the Langstroth monument; that the amount was only about \$100. In his reply he expressed himself quite decidedly to the effect that the bee-keeping world ought to do better, and accordingly sent the following communication. As a result of some private correspondence already instituted, I believe he has increased the fund something near \$50. Strangely enough, more funds have in the meantime rolled into our office—nothing like having a good man to get at a job like this. This is what he has to say:

Having been placed on the Langstroth-Monument Committee I wish to make this final appeal to the bee-keepers of America before erecting the slab that is to mark the resting-place of the most noted character and best loved bee-keeper in our country. It seems to me that, if we neglect this opportunity to do honor to his name, we shall always regret it. Bee-keepers ought to esteem it not only a matter of loyal duty but a loving privilege to contribute to a suitable monument to one whose services to American apiculture have been so universally acknowledged. It is one of the strange things in this world, that very often the inventor of useful appliances fails to receive the rewards due to his genius. Thus it was in Langstroth's case. He builded, we occupy. The world now recognizes his services, but robbed him of the material fruits thereof, when needed. Will this generation be satisfied to let him lie in an obscure or forgotten grave when it is understood that the ingratitude, selfishness, and cupidity of jealous rivals darkened for a time the luster of his achievements, and marred the happiness of a grand good man?

The committee has in preparation an inscription to be engraved on the monument, which recognizes the great services rendered by father Langstroth, and which attempts to pay loving tribute to his memory. It is to be dedicated to him by the bee-keepers of America. It is neither just nor wise that a few men should erect this memorial when every one interested in bees or bee-keeping is reaping the fruits of Langstroth's genius.

A large number of subscriptions, in amounts not to exceed \$5.00, would be a better recognition than a few large contributions. If every reader of these lines, who has not already done so, would send in his contribution to this fund immediately it would relieve the committee from the embarrassment of erecting a monument which they feel is in no sense an adequate expression of the admiration and love felt for the "Father of American Bee-keeping."

The committee will proceed in the spring to erect such a memorial slab as the funds in hand will warrant; and if the reader does not in the next few weeks send in his mite he will miss the opportunity and privilege of being counted as one of the donors.

Forest City, Ia.

EUGENE SECOR.

As formerly, we shall be glad to receive further funds. We promised, I believe, at one time, that we would not bring this matter up again; but Mr. Secor felt that it could not be dropped where it was; so here we go again for another pull.

In our next issue, or as soon as practicable, we will give the amount of funds secured, and hope we may be able to more than double our previous effort, and we shall if Mr. Secor does as well as he has begun.



Like as a father pitieth his children, so the Lord pitieth them that fear him.—PSALM 103:13.

No good thing will he withhold from them that walk uprightly.—PSALM 84:11.

One of our readers has been disturbed, because, as he says, his minister (or perhaps more than one minister) has preached from the pulpit that there would be no family relations in heaven—husband and wife, father and mother, brother and sister, etc.—these would all be done away with. These ministers get their authority, so this good friend says, from the words of Jesus, when he said to the Sadducees, who believed in no resurrection of the dead, "In the resurrection they neither marry nor are given in marriage, but are as the angels of God in heaven." My friend wishes my opinion in regard to the matter through these Home Papers. My opinion is that no minister has any right to make any such statement. By searching the Scriptures we can find very little that is definite regarding heaven. The great Father seems for some reason to have kept us very much in the dark in regard to this, and even in regard to the whole matter of the future state. I have reflected on the passage in question a great many times, and it has always seemed very clear to me that Jesus simply rebuked their low ideals of heaven when he answered their puzzling question, or conundrum, as you may call it. Granting that the Savior's words are literally true, that marriages are not made in heaven, he does not say that marriages made here on earth shall not hold in heaven.

In regard to the matter of one man having several wives, or one woman having several husbands—that is, after the first ones have been taken away—I am not competent to give an opinion. The whole matter, it seems to me, is one beyond our comprehension; and I do not take it to be a very important matter after all. Sometimes here in this world a man or woman marries again, *supposing* the first companion to be dead. When the two husbands or two wives come to light, there is not much difficulty in settling the matter pleasantly all around, and the husband and wife live together happily after these things. It would be strange indeed if such things could not be pleasantly settled to the satisfaction of all parties in that beautiful world beyond. The texts I have chosen, it seems to me, should answer the question. God is to be a kind father to us all; and, furthermore, we have the promise that no good thing will he withhold from us; and both promises are verified here on earth while we love and trust him. If you want my feeble human judgment in reference to the matter I should say most assuredly we shall know all our friends in the great future; and I do not believe that family ties will be broken up—that is, more than is necessary for our highest happiness. If some one of the family deliberately chooses iniquity

and sin, and thus severs his relation from the rest of the family, and dies in that state, I do not think we should be miserable in that future life because of this. If we did all we could for the erring one, our affections "over there" will be so purified that we shall judge as God judges. And I think most ministers of the gospel will, at least pretty nearly, agree with me. In a recent number of the *Sunday School Times* this matter is covered very beautifully. A bereaved mother tells us how she found comfort and peace in believing her loved ones, who had been taken in early age, should be growing and developing—yes, and *waiting* for her, in the world to come. But, dear friends, when I chose the two texts above I had another matter in mind.

After our machinery had got to running fairly well in the factory, so I could be spared a little, I began considering some repairs in that favorite apparatus of mine for storing up heat from exhaust steam. I will explain briefly to our new readers, that for several years we have been taking exhaust steam from the factory and conveying it some 400 feet under ground over to my dwelling. The steam has always been carried through large-sized drain-tiles. The steam, in passing through these tiles, heats the ground for several feet all around them until it not only holds the heat nights but over Sunday. Inside of these tiles are water-pipes connected with the hot-water radiators in our home. The circulation of the hot water through the radiators warms our dwelling nights and Sundays when the factory is not running.

Two difficulties have troubled us more or less for the last five or six years, or ever since this device has been in operation. In order to reach the house the tiles go down into a little hollow or valley, and rise up again before reaching the house. The water from this condensed steam washes dirt into the tiles, and fills them up with mud. Worse still, a great part of the way the steam, in passing over to the house, is going *up* hill while the hot water from the condensed steam is running back *down* hill. Let me say right here that any apparatus for using steam for heating, either live or exhaust steam, should gradually go down hill from the starting-point; then the water and the steam will be both going in the same direction. The pounding and bumping that we often hear in steam-pipes is because this rule is violated. When the water is running one way and steam going the other, there will be a conflict between the two. The steam will sometimes push the water ahead of it, and sometimes send it like a cannon-ball, with a clang; then the water will, by force of gravity, start back again, to be hurled once more in the opposite direction.

Well, just before the cold weather set in I had, at some little expense, replaced the drain-tiles, that had been in so many years, with vitrified sewer-pipe. This answered for a few days; but I was greatly disgusted to find in a little while that the *sewer-pipes* were filled with mud like the other. Now, I do not like to be baffled, as you know. I had spent quite a little money by putting in the sewer-pipes.

I felt both disgusted and impatient. I had been bantered already a great deal in regard to the amount of time and money I had wasted in my project of a "storage battery" for heat. One of the hands in the machine-shop asked me, jokingly, if I had got at my winter's work again, for I worked at it more or less last winter until I went to the Bermudas. The apparatus worked beautifully, so Mrs. Root said, until I got fairly out of sight, then the steam stopped coming, and our men wasted quite a little time in trying to find the stoppage, but they had to give it up. So the hot-water radiators were kept warm the rest of the winter by the hot-water furnace that had been put in to use when the steam got "balky." I told the boys I was at work on a great invention in a hitherto unexplored field, and that it cost lots of money to work out any important discovery. I kept thinking the matter over, and, you may be sure, *praying* over it. At times I felt almost ashamed to ask for wisdom from above, simply because this was a hobby of mine. I told myself the temperance work, the missionary work, and a thousand other things were of so much more importance that I should be ashamed of devoting so much thought (and prayer) to this sort of "play," as a good many might term it. But I could not get the matter out of my mind. I enjoyed myself more working in the mud and hot water, with those tiles, than with any thing else in the world—at least while I was demonstrating or testing some new ideas. I felt ashamed to confess it to anybody else, but I think I may tell you, dear reader, that I lay awake nights waiting for daylight so I could go on with the work I loved. My appetite was excellent—no trouble from indigestion—and I was so full of enthusiasm that I could hardly take time for my forenoon nap. I managed, however, to sleep fifteen or twenty minutes in order to gain strength to go on with the work. After my glazed sewer-pipe had failed I began to consider iron pipes, laid from the factory almost over to the house. I was agreeably surprised one day to find I could buy three-inch pipe for 13 cents a foot; and 230 feet would carry the steam near enough to the house, where the tiles ran up a very good grade into the cellar. This latter 100 feet or more had never been troubled with water or mud. One great trouble with iron pipes is their expansion and contraction. A pipe 200 feet in length is several inches *longer* when hot steam is passing through it than when cold; besides, it does not heat up a body of ground as the tiles do. With much trouble and expense I pulled out all the sewer-pipe that had been laid so carefully. Then I put it down again, sloping toward the house on a grade of one inch fall in every twenty feet. The iron pipe was put inside of this tile; and when at the lowest point near the house a "bleeder" was put in, or a smaller pipe, to take away the hot water formed by the condensed steam.

Near the factory, of course, we had to carry the pipe clear up to the surface of the ground in order to get the requisite fall. To provide for the contraction and expansion, an elbow

was placed at the starting-out point so it would turn like a hinge; then the first half of the pipe was put in a wooden box with a smooth bottom of oak plank. On this oak plank, every four or five feet we placed little iron rollers so the pipe could crawl back and forth without smashing things up generally. To put in such a piece of work in the dead of winter is quite an undertaking. Two men (special friends of mine) said they could stand it if I could. When we were putting the pipe together one of the men from the machine-shop kindly went down into the mud and water with his tools in order to make the connections. Right in a critical time, when we were afraid our ditches would all cavé in through the influence of the frost and rain, it seemed one morning as if we should have to give it up until winter was over. Some of the work had cavé in, the tiles were out of place, and the outlook was exceedingly discouraging. My clothes were so muddy I looked worse than any tramp. I had a "crick" in my back from lifting injudiciously; my rubbers came off in the mud; my shoestrings were untied; my nose needed wiping, but my hands were so muddy that I could not get at my handkerchief; then, besides, I felt I was taking cold. But yet I did not want to give up the thing that was so dear to my heart. I remembered well the little prayer as I stood still in my predicament. My good-natured helpers were waiting for me to decide what to do next. I felt almost ashamed to utter simply that old brief petition, "Lord, help!" I prefaced it with something like this: "O Lord, if this thing thy servant holds so dear to his heart is not displeasing in thy sight, wilt thou once more, as thou hast so many times in bygone days, help him to succeed in this undertaking—not for his own sake alone, but for others who may be so situated as to be able to avail themselves of what he may accomplish." I remember wondering then if I should be able to tell the men what to do as I had so many times before under similar circumstances. And, dear reader, this case is no exception to my previous experience. All at once I saw how I could change my plan, at no very great expense, and make a decided improvement. The sun came out in a little while; I fished my rubber out of the mud, tied my shoes in spite of my lame back, got another pair of mittens while Mrs. Root washed the muddy ones, and after the sun came out we had very good weather until the work was completed. The apparatus worked to perfection so far as the steam was concerned. Mrs. Root rejoiced to feel the floor under her feet *warm* once more as the steam coursed through the pipes in the basement; and in a very little time the steam was pouring out of the chimney (after having warmed the house) instead of wasting itself in a zero air over at the factory.

I said the steam went through all right; but not so with the hot-water pipes. Owing to some changes made, the water would not circulate. I waited two or three days; ran water through under pressure to get out all the air; but every little while the radiators would be cold again. I knew what the trouble was, or

pretty well. Our radiators and water-pipes had been put in piecemeal during several years past. An experienced plumber told me they were not put in according to rule, which I knew already. He said the pipes would have to be all taken out and the thing reconstructed; but I could not do so in the dead of winter, as part of them were inside of chimneys, and Mrs. Root could not think of having her house all torn up—surely not in mid-winter—for any more fussing for my pipes.

While considering this matter, just before taking my nap one day, I knelt down right near the complicated system of pipes—pipes that had been put in by my own hands, and that I loved almost as if the rusty iron things had life and sense. I knelt down and prayed that I might have wisdom and understanding to make the water-pipes work, even as the steam-pipes were working, without expensive reconstruction. Dear friends, I oftentimes hesitate about telling you these things; and some good people chide me for so doing; but yet I know from your letters that many, like myself, have learned to find peace, happiness, and success by putting their trust in God;* and if my Home Talks shall help you to have faith in promises like the two or three I have chosen to-day at the head of this article, then I am certainly on safe ground.

I can not remember exactly now, but I think that, when I awoke from my nap after that little prayer, the pipes were hot. They kept getting hotter all day. Mrs. Root exclaimed with surprise that the parlor radiator, which had never before been *really* hot, was now giving off heat at a surprising rate; and some *indirect* radiators that had been put in for live steam years ago were also hot; and finally all the radiators in the house—eight in number—were as hot as if heated by the furnace; and, last of all, the furnace itself, with its large hot-water boiler, was so hot that it seemed as if there *must* be a fire inside when there was not a spark.† We let the fire in the furnace

* Even while I write this footnote the following exceedingly kind letter is brought to my notice:

BRO. ROOT:—Although I am nearly as old in life as you are, I can not help looking on you as a father. I owe much of my success in life to you and GLEANINGS. I am not rich, it is true. I have 170 acres of land worth \$60 per acre, and have from \$3000 to \$4000 worth of personal property, and owe no man a dollar, and I attribute nearly all of it to one hive of bees and a copy of GLEANINGS obtained about 16 years ago—not that I made much out of bees, but somehow they and GLEANINGS instilled into me economy and a new life that I had never known before, and thereby prospered; and to you I give most of the credit.
M. F. TATMAN.

Rossville, Kan.

† During this busy life of mine I have had many disappointments. I presume I am naturally too sanguine, and so these disappointments and unexpected obstacles probably do me good—they ought to. Well, when any thing goes away *beyond* my expectations, I confess it is a "happy surprise;" and most of my happy surprises in this line come after I have prayed very earnestly and repeatedly over some particular thing. The old indirect radiators I have alluded to were originally used for live steam. I never expected the hot water to heat them. The feed-pipes were too small. They had never been removed from the place where built in chimneys in the basement because it would tear things up so to get them out. Well, this is not the first time, by any means when my petitions have been granted away beyond what I had ever hoped for or dreamed of; and it is even now a matter of astonishment to me to see that small iron pipe coming out of the cellar floor, from the ground outside, and sending such an amount of heat all over the house, up stairs and down.

go out, and saved our coal. In fact, we have not burned a bit of coal since—not even in zero weather—except on Sunday. You see, running the steam in an *iron* pipe so great a part of the distance does not give the "storage battery" result to the same extent it did with my former drain-tiles. For heating hot-beds with exhaust steam we still use tiles; but I think that, if I were going to do it over again, I would use sewer-pipe with bells or flanges where they unite together. Where a great amount of exhaust steam is to be taken through the ground, iron pipes are best and safest, for the great heat, with so much dampness, is quite liable to break tiles.

This matter of utilizing exhaust steam from factories or places where a steam-engine is used for any purpose is getting to be an important matter. Where the steam is allowed to spout out into the open air, and go to waste, an enormous amount of heat is dissipated and lost—more than almost anybody has any idea of. All the radiators I have mentioned are warmed by 1½-inch pipe exposed to a jet of exhaust steam for less than 100 feet; and the system of piping, as I have remarked, is very awkward, and not at all according to plumbing-rules. In fact, it is a surprise and a mystery that it should work at all, and give such results as we are now getting.

You may readily imagine that, after all this toil and anxious solicitude, I now feel happy every time when I go into my home, and stretch out my hands before the hot radiators; and when I thus stretch them out you may be sure I do not forget the great Father above who has said in his holy word, "Delight thyself also in the Lord, and he shall give thee the desires of thy heart." Dear brothers and sisters, perhaps you wonder that I found a text to express so completely my feelings as the above; and you may be surprised again when I tell you that my eye alighted on that verse by chance, as it were, right while I was dictating this Home Paper. The little Bible lay open before me where it seems to have opened of itself, to the 37th Psalm; and my eye caught the fourth verse without seeing any thing else on the page. It was directed, perhaps, by two pencil-marks; and as the book belongs to my good friend W. P. Root, who is taking down these notes, I shall have to suppose that the pencil-marks are of his own making.

This promise is all the more precious to me because of the word "desires." This thing I had been working on and praying over was one of the "desires" of my heart; and sometimes I felt a little uneasy, because I did not feel exactly sure that it was right for me to enjoy myself in working out problems of this kind. I felt, of course, that it was an innocent pleasure or recreation—certainly as harmless as to spend my time in what is called "questionable amusements," and far better. Some of the happiest hours God has ever given me were spent in exploring the realms of science, such as heat, electricity, hot-water circulation, etc.; and how beautifully this text comes in! "Delight thyself also in the Lord;" that is, make him your confidant, your part-

ner, your companion in every thing you enter into, whether it be work or play; and then what a wonderful and precious promise is the remaining part of that beautiful verse! "and he shall give thee the desires of thy heart."



YELLOWSTONE PARK AWHEEL; HOW TO MAKE THE TRIP WITHOUT PAYING OUT ANY MONEY AT ALL, PROVIDING YOU HAVE THE "MUSCLE."

A. I. Root, Friends, Brothers, and Co-cyclists:—I will introduce myself by saying I became acquainted with Mr Root through his journal, taken by Mr. and Mrs. Messenger, whose farm joins mine. I will say, Mr. Root, that further acquaintance with you was induced by the fact that you love the bicycle. And, again, I was further interested when you stated that you were about to tour the park on your wheel, for I already had plans matured for a similar trip.

I am an ardent lover of cycling, and so a friend and I planned and accomplished a tour on wheels from here (Northwest Nebraska) to the park via Billings, Livingston, and Cinnabar, and on through Idaho and Utah to Salt Lake City, and return home via Cheyenne—a circuit of over 2200 miles, and all on wheel but 500 on the home run.

I hoped very much to meet with you on the trip. I think likely you passed us at Livingston, as we were there from Aug. 2 to 15. We worked our way, and Livingston was one place where we stopped and worked. We traveled from place to place till money was gone, and then worked and replenished, and in this way made expenses from start to finish. We planned our trip, and worked to the outline all through.

When we left Cinnabar we loaded our effects and four weeks' provisions on our wheels. We have the honor of carrying the heaviest loads through the park on bicycles that were ever known.

We left the park on the west, and went to the Oregon Short Line, 100 miles due west from Fountain Hotel. When we left Cinnabar we had 75 lbs. of effects and 75 lbs. of provisions. When we reached Monida, on the Oregon Short Line, we had 75 lbs. of effects and 20 lbs. of provisions. Notwithstanding this heavy load we could and did make good speed; but as a rule our trip for a day was short, as we went to see the park. Our longest day's ride in the park was 30 miles.

We reversed the circuit from Norris, and went to the left via Grand Canyon, Lake, and Thumb. Our equipment consisted of tent, 9x9, bedding, cooking utensils, repair tools and repair supplies, and provisions; also gun, field-glass, and various little conveniences. We were 28 days in the park, and I hope and expect to go again soon. I shall ride a wheel in the park, even if I go and return otherwise. I think a wheel beats all other modes of travel in the park, and I also want to be free from all schedule time such as the coach runs by.

I read all of your articles with much interest, but smiled where you said, "Any one making this trip in the park should not carry a pound of luggage," or words to that effect. I thought, "What would Mr. Root think if he had seen us with our 75 lbs. on each wheel, and riding eight miles an hour?"

Of course, we walked up the steeper hills; but none troubled us much except the Mammoth Springs hill, and that one we divided, as we camped one mile west of the Post.

I read your recitals with keener delight, no doubt, because I followed the route on my wheel; and I followed you in detail; and at such places as Willow Camp I stopped as you did, to inspect the camp, etc.; but if you had ridden on through, your descriptions would be more interesting to me.

We rode scores of miles on our wheels in the geyser fields where otherwise we should have had to walk or forego the trips as you did. Such freedom and ease no one can enjoy as on a wheel, in the geyser fields. I can see by your description that you were very limited in your explorations on account of your depen-

dence on the stage; and yet you enjoyed many privileges you could not on the transportation coaches.

Many places of great interest you fail to describe; and I take it you were not there, and also other places you did not see personally, or you would describe them differently. Some of these, as it appears to me, are such as Gr-at Fountain, Biscuit Basin, Specimen Lake, Sunlight Basin, Natural Bridge, Sulphur Mountain. Just for a moment think of Prismatic Lake, in Midway Basin, close to Excelsior Geyser. You will recall how the hot water overflows on all sides, and how difficult it is to approach it, and also the dangerous appearance of the crater, as the edges jut over, like ice in a pond, around an opening. But I wish you could have seen me there. A wheel there is just the right thing. The one to two inches of water was no hindrance to a wheel, and I sailed around and around it like a hawk, and so near the edges that it took all the courage I could muster.

Well do I realize your feelings as you describe the Excelsior. I had similar thoughts as I looked at it and encircled it.

Your description of Riverside Geyser comes right home, for we camped right above it in the timber for four days—camped right by the spring that supplies the Wylie Camp there. Your experience with the Geyser water was different from mine. If you will, absorb a little "Christian Science" the geyser water will not hurt you. I drank it with impunity, with no results different from those from other water. I made coffee with it also. I bathed in it, and washed clothes in it. I visited all the Wylie camps. I rode on steamer Zilla, and rowed skiffs several trips; went to the island and returned, and also to the Thumb. I was raised on the waters to a great extent. I lived in Ohio, on the Ohio River, near Parkersburg. All my folks were Quakers, and I helped on the underground railroad. Our house was a station. You see you are not so very much older than I am.

I visited the bear at Lake Hotel many times. I succeeded in approaching to within seven feet of one as he culled the garbage. I was there when the "silver tips" whipped twice their number of black bears.

Excuse me if I criticise you once. Where you speak of the fish at Wylie Camp, at the lake outlet, you call them speckled trout. The fact is, there is not one speckled trout in the lake or in its outlet. They are salmon and rainbow. Between Billings and Livingston (15 miles west of Billings) we stopped over night with a man who has bees, and takes your journal. He is a preacher too. We talked of you, and I told him of your proposed trip, and he said he should much like to see you. My partner cleaned their organ, and took pay in honey and butter.

I hope you will excuse me for writing such a long letter to a stranger. It is presuming lots to think it will pay you to read it all. But I am such a lover of the wheel, and of touring, that your trip and description enthused me.

R. M. STANTON.

Chadron, Neb., Jan. 1.

My good friend, why in the world didn't you write me a postal card and tell me what you were going to do, so I could have made one of your party for at least part of the time? I confess I was a good deal disappointed when the time came for me to start, and not a man or boy who reads GLEANINGS had proposed joining me on that trip. I hardly think I should have taken the coach—at least not to the extent I did—had I just found somebody to talk with and compare notes, etc. When I gave my instructions not to carry a pound of baggage I was talking for the average person; and, dear friend S., if you have never before in your life thanked God for your muscle and for the muscular strength he has seen fit to give you, just get right at it this minute. Another reason why I advised stripping the wheel was because the Wylie people would carry one's luggage on the stage for only 25 cents a day. With my comparatively feeble health and strength it was worth 25 cents several times over to have all the things needed taken on the coach, and have them waiting for me at each stopping-place.

I shall have to confess to you, since you mention it, that I described one or two places briefly that I did not visit; and if I made mistakes, I think they are in the guide-books. I feel very sorry for having omitted Sulphur Mountain; but the ladies in our coach had been there, and did not care to go a second time; nevertheless, the driver said he would take that route, which was quite a little longer, if I insisted on it; but as I was the only person in favor of going that way, of course I could not well urge it; and my wheel was not with me, so I could not go where I pleased, as you did. Then there is another thing: Where one goes all the way on the wheel, especially if he is alone, there are a great many things he might not find at all. In fact, I spent a great amount of time at Mammoth Springs in trying to find certain things from the guide-book. I could not very well ask the guides to help me, whom I met occasionally, for they were hired to direct those who patronized their company. I became very tired in going afoot over the geyser basins; but my wheel was left behind at Norris. I, like yourself, Providence permitting, am going again through Yellowstone Park, and with my wheel; and if you will let me know when you are ready I will try to be on hand; and may be some other reader of GLEANINGS will make one of the party after reading your graphic description, and finding out how cheaply it can be done by one who has the muscle and does not have the cash. By the way, was it not rather dangerous for you to ride on your wheel over that thin crust, so near to those bottomless pits filled with water boiling hot? I should have supposed that the hot water would injure your rubber tires, for I am told it spoils a good many shoes belonging to visitors.

In regard to the geyser water, I still think it risky business for most people; but with your robust health, and after the tremendous muscular exercise you had gone through with, your system was ready to throw off or resist effects that would have been dangerous to dyspeptics. Very likely much of the hot water is all right; but there are certain springs that contain minerals in solution that give the water a very bad taste, at any rate. Look here, old chap; there is another thing I want to mention. You made all this trip, as you say, and you succeeded in finding a job where you could earn cash, no matter where you happened to be; and I am pretty sure I am right when I tell you that numbers of people, probably, were in all those localities hunting for work and could not find a job to pay for even board and lodging. I know something about it; for when I am traveling I almost always inquire what the chances are to furnish work for the people in various places. Livingston, for instance, seemed in a good many respects a dead town; and yet, as I take it, you two got jobs without any trouble, and got pretty fair pay. May be the sight of your muscle, your ability to ride, and carry a load, had something to do with it; but my opinion is, you two fellows have got hold of the knack of making yourselves useful wherever you hap-

pen to drop down; and I take pleasure in publishing your letter, because it shows what a "hustler" can do when he takes a notion to do it.



NEW POTATOES WORTHY OF MENTION.

On page 805 of our last year's volume I told you I had a potato-story to relate when I got around to it. I reached the residence of my cousin, Wilbur Fenn, after a long wheelride, quite a little after dark, but I found a warm welcome from the whole family, from the least to their eldest daughter, the one who is worth more than any \$1.50 man to watch the pieces of potatoes in the potato-planter, and make them go right. Next morning it was hardly dry enough to dig potatoes; but there was such a strong prospect of more wetness still that the Hoover potato-digger was got out and started. I do not know whether they made it go all day or not; but I do know that I rode nearly fifty miles on my wheel, most of the way over clay roads, that day, even if it did rain more or less at about every step of the way. But I rather enjoyed it, notwithstanding the rain. You know one of my special enjoyments is to breathe damp air while I am riding a wheel. On this account I like to ride while the dew is falling on moonlight evenings. But this was to be a potato-story.

Cousin Wilbur's largest field of potatoes was not yet ready to dig. It was almost November, but there had been no killing frost, as you may remember. The Monroe Seedlings had died down more or less from something that might be blight or might be something else. We could not exactly agree about it; but right down through the field there were several rows of Monroe Seedlings right alongside of the rest, but with the foliage green and luxuriant. Of course, these thrifty-looking rows caught my eye.

"Why, Cousin Wilbur, you say these are all Monroe Seedlings. If this is true, what in the world is the reason those few rows stand up green and thrifty while the others are mostly dead or dying?"

"Well, cousin, you have struck on just what I wanted to show you. Last season I noticed here and there a hill in my large field that was bright and green while the rest had died down; and the question arose in my mind as to whether this was a sport of something better, or whether it was owing to the soil in just that spot. To settle the matter I let those thrifty hills get fully ripe, dug them by hand, stored them by themselves, and planted them this year as you see, and *there they are.*"

We got down on our knees and dug quite a few hills of the thrifty ones, and then an equal number of the others. There was no mistake in the matter. Cousin Wilbur had, by this plan of selecting hills, *in just one season*, secured an improved strain of

Monroe Seedlings.* They are a larger potato than the others, and better yielders; but it would seem they are rather later in maturing, and there is a strong probability that they will resist the blight better than the ordinary strain picked up just as they come. Now, here is something exceedingly important to the potato-grower. By selecting the best hills for seed next year he can not only improve the quality of his potatoes but increase the crop to one-half or to double. Whether it will work the same every season or not, experiment alone can determine; but I have tried the same thing myself enough to know that a *good deal* can be accomplished in this manner. I managed to get one bushel of these improved Monroes; but Mr. Fenn did not really want to spare even one bushel. The Monroe Seedlings seem to be not only equal, but rather ahead, all things considered, in that locality—Summit County; and this improved strain ought to give something wonderful in the way of results.

Now, there was another stretch of a few rows in the same patch, that showed a difference, and this was what he called his Russet potato. The surface of the potato is rough or netted just like a russet apple. A fertilizer agent had given him some of these potatoes to try, declaring that that they would never scab under any circumstances nor in any ground; and I believe that, after digging, he found no scabby potatoes among the Russets; but, for that matter, there were almost none among his Monroe Seedlings, for Cousin Wilbur has managed for years (by taking great pains) to keep pretty nearly clear of scabby potatoes. I said then and I say now that I will give a thousand dollars for a barrel of potatoes, equal to our best in other respects, that will not scab in any ground with any kind of fertilizer. I should not want to pay this thousand dollars, however, till I had tested the potatoes for about two seasons. If any of you have such a potato, send along your barrel. I have a bushel of the Russets, and they *may* fill the bill; but I have so much doubt in regard to it that I make the above offer.

Special Notices by A. I. Root.

POTATOES WE HAVE TESTED AND FOUND WORTHY OF MENTION.

I suppose you are aware that I have for many years been testing all the promising varieties of potatoes, and I have the following quantities of the kind mentioned below:

Poor Man's Friend, 12 bushels; Sir Walter Raleigh, Queen of the Valley, 4 bushels each; Russets, 1 bushel; Fenn's Improved Monroe Seedling, 1 bushel; Early

Burpee's Extra Early, 2 bushels each; Hundred Fold, 2 bushels; Adirondack, 7 bushels.

Poor Man's Friend gives a good crop of great round red potatoes, and the yield is tremendous, even on very poor soil. Sir Walter is a good deal like Carman No. 3. From my own experience I can not see that it is particularly better. Queen of the Valley is considerably like New Queen, but it is of extra quality. The four early potatoes—Vaughn, Zehr, Andes, and Burpee's—all yield about alike. Early Vaughn kept on growing clear into the rainy fall, while all the rest died down, with the exception of the New Queen. Hundred Fold is an exceedingly good late potato, and I may say the same of the Adirondack.

Now, you see I have not enough of the above to offer them for sale unless it is in very small quantities; but if any of you want some of them to try we will send 1 lb. by mail for 18 cts.; or 3 lbs. by mail for 45 cts. By freight with other goods, $\frac{1}{2}$ peck for 25 cts.

Fenn's Improved Monroe Seedling and the Russets we shall offer only by the pound. By the way, I notice quite a number of the new seed catalogs are offering a Russet potato; and although they call it by different names, my opinion is, from the picture and the description, it is the same thing I have described.

MILLS' PRIZE POTATO.

I always dislike to make our list of strawberries, potatoes, or any thing else, larger when it can be avoided. We have already too many good kinds of almost every thing; and unless the new comer is something very much ahead of varieties already listed, we can not afford to give them a place. Just now, however, we are so much pleased with the potato called Mills' Prize that I have decided to add it to our list. It very much resembles the Rural and the Carman's; in fact, I could not tell it from a very nice sample of Carman No. 3. The potato yields as well as any of these varieties; and last, but not least, it is the best cooking potato I have ever got hold of unless it is the Freeman. The potatoes are very much larger than the Freeman, of nice shape, and as handsome as any potato I ever saw. If they are always as good as the crop of the present season, I can not understand why there has been no more stir in regard to them. Mills, in his catalog, gives them only about half a dozen lines. He says, it is true, they are "fine-grained, and cook dry and mealy;" but the catalogs are in the habit of saying this of almost every variety. By the way, a recent number of the *Rural New-Yorker* suggests that *quality* in potatoes is an uncertain element in spite of us. They say the Rural New-Yorker some years cooks beautifully; then at other times in other seasons it does not, and I have frequently noticed this. Notwithstanding, there are certain kinds, like the Freeman and Snowflake, that are always fine. Now, I can not tell whether Mills' Prize is always up to its present quality or not. A neighbor who has grown them for several years, and who sold me about 50 bushels, says they are always nice. If you want to try them, either for planting or eating, we will fill your order at the same price as the Rural New-Yorker; viz., 1 lb., by mail, 15 cts.; 3 lbs., 45 cts.; by freight or express, $\frac{1}{2}$ peck, 20 cts.; peck, 25 cts.; $\frac{1}{2}$ bushel, 40 cts.; bushel, 75 cts.; barrel of 11 pecks, \$2.00.

CARLOAD SHIPMENTS.

Since we started our factory again, six weeks ago, we have shipped six carloads of goods for export, a car to the Rawlings Imp't Co., of Baltimore, Md.; one to J. M. Jenkins, Wetumpka, Ala.; one to Walter S. Pouder, Indianapolis, Ind.; a car of sections to Provo City, Utah; a carload of hives to L. A. Watkins Mds. Co., Denver, Col.; and as we go to press we are loading a car for our northeastern branch at Mechanic Falls, Maine, and another for Chicago. We have orders booked and material partly made for fourteen more carloads for export, besides a number of carloads for different points in the United States.

CATALOG CHANGES FOR 1899.

In our forthcoming catalog, which we will begin distributing about Feb. 1, we will show a number of improvements in the details of our Dovetailed hives. The table of prices is slightly advanced to partially cover the advancing price of lumber. The wedge-top Hoffman frame is substituted for the molded top as regularly sent out; and if any prefer the molded top this will have to be specified in the order. The price of Root zinc will be advanced to \$1.40 per sheet; 90c per 100 strips; and honey-boards of R. zinc will be advanced 2c each right through. There will be no change in price of Tinker zinc. The Danz. hive will be omitted from the general catalog, as we have a

* When I visited James Smith, of Green Bay, Wis., he told me that, notwithstanding a good many people claim the Early Ohio potato had deteriorated, by constantly selecting his seed from the best and most thrifty hills he had succeeded in keeping it up to its original productiveness and good qualities in every respect. Seed potatoes saved from selected hills in this manner would, of course, have to bring a better price, and they will be worth it. Now, who will go to work and win for himself a reputation for extra selected seed potatoes? The simple claim that they are thus selected, without the name of some good careful man to back it up, would not amount to very much. Vaughn and Zehr, $2\frac{1}{2}$ bushels each; Early Andes and

special circular describing this hive, which will be sent on application. Comb foundation will be listed at the following prices:

	In lots of	1 lb.	5 lbs.	10 lbs.	25 lbs.
Medium brood,		50	48	46	44
Light brood		52	50	48	46
Thin surplus,		57	55	53	51
Extra thin surplus,		60	58	56	54

50-lb. lots, 1c per lb. less than in 25-lb. rate.

CONVENTION NOTICES.

The Wisconsin State Bee-keepers' Association that will meet Feb. 9 and 10, 1899, in Madison, promises to be the best one held for years. An interesting program will appear in next issue.

N. E. FRANCE, Sec.

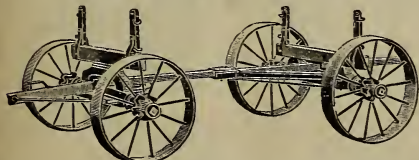
SEED DUE BILL FREE

To get new customers to test my seeds I will mail my handsome catalogue for 1899, lithographed and beautifully illustrated, and a 10c. Due Bill, good for 10c. worth of seeds for trial, absolutely free. It is full of bargains. All the Best Seeds, Bulbs, Plants, Roses, new Fruits, Farm Seeds, Potatoes, etc., at lowest prices. Ten Great Novelties offered without names. I will pay \$50. FOR A NAME for each. Don't buy your stock until you see this new catalogue. Several varieties shown in colors. * Great inducements for orders this year. You will be surprised at my bargain offers. Send your address on Postal to-day. Tell your friends to send too. Old customers will receive a copy. F. B. MILLS, Seedsman, Box 105, Rose Hill, N. Y.

In writing, mention GLEANINGS.

BUY THE BEST.

If you want the best low-down wagon you should buy the Electric Handy Wagon. It is the best because it is made of the best material; the best broad-tired Electric wheels; best-seasoned white hickory axles; all other wood parts of the best seasoned white oak. The front and rear hounds are made from the best angle steel, which is neater, stronger, and in every way better than wood. Well painted in red, and var-



nished. Extra length of reach and extra long standards supplied without additional cost when requested. This wagon is guaranteed to carry 4000 lbs. anywhere. Write the Electric Wheel Co., Box 95, Quincy, Illinois, for their new catalog which fully describes this wagon, their famous Electric Wheels, and Electric Feed-cookers.

In writing, mention Gleanings.

Maple Syrup and Sugar

are scarce this season; the bogus article is never so. We can please you if you want the pure maple.

2 to 6 gallons fancy syrup at 90c; Nos. 1 and 2 grades, 5 and 20c less per gallon respectively. For more than case lot, club order, etc., write.

AS TO OUR RELIABILITY, write Boughton, Ford & Co., Bankers, Burton, O., or Adams & Ford, Cleveland, O.

Ohio M. S. Co., Burton, Geauga Co., O.

Farm Bee-keeping

Is one of the leading departments in the Modern Farmer and Busy Bee, the best Farm and Bee paper in existence. Write for sample copy and for clubbing rates with any paper you want.

E. TAYLOR ABBOTT, St. Joe, Mo.

NEW STRAWBERRIES

Largest and Most Complete List of Popular Varieties in Michigan. BIG, HEALTHY PLANTS, FRESH DUG, and GUARANTEED to all parts of U. S. and CANADA. We also make a specialty of Choice Michigan-grown SEED POTATOES. Send for Descriptive Catalog, FREE TO ALL, and note what our customers say of our graded stock.

Flansburgh & Peirson, Leslie, Mich.

In writing, mention Gleanings.

Wants and Exchange.

Notices will be inserted under this head at one-half our usual rates. You must say you want your ad in this department, or we will not be responsible for any error. You can have the notice as many lines as you please; but all over five lines will cost you according to our regular rates. This department is intended only for bona-fide exchanges. Exchanges for cash or for price lists, or notices offering articles for sale can not be inserted under this head. For such our regular rates of 20cts a line will be charged, and they will be put with the regular advertisements.

WANTED.—To know what you have to exchange for new varieties raspberry-plants, Campbell and Alice grapevines and cuttings, and eggs from fine B. P. Rocks. MRS. LIZZIE MCQUEEN, Baltic, O.

WANTED.—To exchange apiarian supplies for colonies of bees from the South in April. I. J. STRINGHAM, 105 Park Place, New York.

WANTED.—Man who understands bees, gardening, and hotbeds, for coming season. Must give reference. JAS. WEST, Box 229, Montpelier, Ind.

WANTED.—One barrel of honey-dew or cheap honey for spring feeding; send sample. Also one second-hand footpower saw. DANIEL DANIELSON, Clarkson, S. D.

WANTED.—To exchange one female ferret, well trained, for bees or bee-supplies. FAY W. MYER, Box 431, Hastings, Neb.

WANTED.—To exchange thoroughbred Silver-laced Wyandottes, S. C. Black Minorcas, or Buff Leg-horns, for bees. Write DR. A. F. RUBLE, Inverness, Ohio.

WANTED.—To buy hard candied buckwheat honey from a keg up to a carload. LOUIS CHERRY, 240 South St., Philadelphia.

WANTED.—Situation by expert apiarist to handle bees the coming season on shares or otherwise. Any healthy location. THOS. ELLIOTT, Adams House, Adams Street, Chicago, Ill.

WANTED.—To exchange one thousand wide frames with tin separators, for something I can use. C. J. BALDRIDGE, Kendaia, N. Y.

WANTED.—To exchange two small printing-presses and printing outfit for bloodhounds, ferrets, fancy poultry, bicycles, or something I can use. JAMES M. DENHAM, Valley, Ky.

WANTED.—To exchange supplies for bees on Dada-dant's frames. I. J. STRINGHAM, 105 Park Place, New York.

WANTED.—No. 1 white comb honey in 4x5-inch sections; also to furnish my hives and 4x5 sections for a share of the next honey crop, to parties within 100 miles of this city. Address at once F. DANZENBAKER, Washington, D. C.

WANTED.—Young man who does not use liquors or tobacco to work the coming season on farm where honey, fruits, and general farm crops are raised. Give references. C. J. BALDRIDGE, Kendaia, N. Y.

WANTED.—Your address for a free copy of my book on queen-rearing. HENRY ALLEY, Wenham, Mass.

Our Factory is the Largest, Our Facilities are the Best.

We are Located

on the banks of the St. Croix among the saw-mills, where we are able to select the best lumber. We buy it cheap.

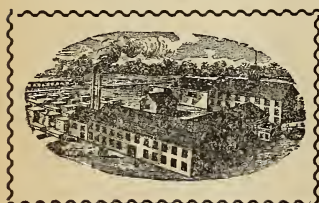
We kiln-dry our Lumber, and Manufacture

BEE-HIVES, SECTIONS, AND SHIPPING-CASES.

We Handle Bee-keepers' Supplies. We are Prompt Shippers.

Write for catalog.

Interstate Mfg. Co., Hudson, St. Croix County, Wisconsin.



BEE-SUPPLIES.

We have the best-equipped factory in the West. Capacity—one carload a day; and carry the largest stock and greatest variety of every thing needed in the apiary, assuring best goods at the lowest prices, and prompt shipment.

Illustrated Catalog, 72 Pages, Free.

We also manufacture Tanks of either wood or galvanized steel, all sizes, any form, and for all purposes. Price list free.

Address **E. KRETCHMER, Red Oak, Iowa.**

In writing advertisers, please mention Gleanings.

PRICES OF

Bingham Perfect Bee-smokers and Honey-knives.

Smoke Engine (largest smoker made.)	4-inch stove.	Doz.	\$13.00;	each, by mail,	\$1.50
Doctor.....	3½-in. “ “	“ “	9.00;	“ “	1.10
Conqueror	3-in. “ “	“ “	6.50;	“ “	1.00
Large	2½-in. “ “	“ “	5.00;	“ “	.80
Plain	2-in. “ “	“ “	4.75;	“ “	.70
Little Wonder (wt. 10 oz.)	2-in. “ “	“ “	4.50;	“ “	.60
Honey-knife.....		“ “	6.00;	“ “	.80

Bingham Smokers have all the new improvements. Before buying a Smoker or Knife, look up its record and pedigree.

FIFTEEN YEARS FOR A DOLLAR; ONE-HALF CENT FOR A MONTH.

Dear Sir:—Have used the Conqueror 15 years. I was always pleased with its workings, but thinking I would need a new one this summer I write for a circular. I do not think the 4-inch Smoke Engine too large.

January 27, 1897.

Truly, W. H. EAGERTY, Cuba, Kansas.



T. F. BINGHAM, Farwell, Michigan.

To Sell or Lease for Cash.

An up-to-date apiary consisting of 200 good colonies or over, with fixtures complete. Privilege to remove to some other location if desired. Correspondence solicited. Address

The Gila Farm Co., Cliff, Grant Co., N. M.

In writing, mention GLEANINGS.

Queens.

I will be ready as usual to furnish queens the coming season. Many unsolicited testimonials tell of the superiority of the Laws strain of FAULTLESS 5-BANDED WORKERS. BREEDING QUEENS always on hand. Price \$2.50 each. I am also breeding the leather-colored stock from imported mothers. Tested queens of either strain, \$1.00 each; 6 for \$5.00. Untested, 75c each; 6 for \$4. Queens ready in season.

W. H. LAWS, Lavaca, Seb. Co., Ark.

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FOR SALE.—7000 lbs. fine white Extracted Honey. Also Southern Bloodhounds.

Ellis Fox, Hillsboro, Wis.



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Dovetailed Hives,

Sections, Extractors, Smokers, and every thing a bee-keeper wants. **Honest goods at close honest prices.** 60-page catalog free.

J. M. JENKINS, Wetumpka, Ala.

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